

Nutritional risk and care in elderly hospitalized patients

A mixed methods research approach

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To Fride and Kristian

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Summary

Background: Undernutrition and the risk of undernutrition occurs frequently among the hospitalized elderly, and can result in a variety of negative consequences if not treated. A large proportion of elderly patients are already undernourished, or at risk of becoming so, on hospital admission. Nutritional status often deteriorates during their hospital stay. In 2009, national professional guidelines on prevention and treatment of undernutrition were published in Norway. In line with European guidelines, four key recommendations are underlined: to assess nutritional risk, to provide patients at nutritional risk with appropriate nutritional treatment, to document nutritional status and treatment in the patients' medical records, and to communicate this documentation between healthcare settings. There is, however, a limited body of research available today exploring how undernutrition is addressed for elderly hospitalized patients in Norway, and no adequately designed prevalence study has been conducted exclusively on elderly patients.

Aim: The overall aim of this thesis was to explore nutritional risk and nutritional care among elderly hospitalized patients in Norway.

Methods: This thesis has employed a mixed methods research design. A cross-sectional study was conducted in the period 2011–2013 at one large Norwegian university hospital. A stratified sampling technique was utilized, to improve the representativeness of the sample. In total 173 second-year nursing students in acute-care clinical studies on 20 wards screened 508 non-demented elderly patients (≥ 70 yrs) for nutritional risk by employing the NRS2002. Data on nutritional care in line with the national professional guidelines were also recorded. Two focus group sub-studies based on a hermeneutic phenomenological methodological approach were conducted in 2012. Four focus group interviews with 16 nurses working in seven somatic wards at the university hospital and five focus group interviews with 27 nurses and undergraduate nurses working in short- and long-term units in five associated nursing homes were performed. The discussions focused on the four key recommendations in the national professional guidelines, and identified barriers to ensuring adequate nutritional care as well as describing how nutritional information was documented and communicated. Pilot studies were conducted prior to the main studies.

Results: The prevalence of nutritional risk was estimated to be 45.4% with 95% confidence interval (41.7%; 49.0%), ranging between 16.7% and 65.0% on different hospital wards.

Patients nutritionally at risk had been in hospital longer and had lower average weight and BMI compared to those not at risk (all $p < 0.001$); no differences in mean age or gender were observed. A screening tool had been used on six (1.2%) of 478 patients in the ordinary hospital setting, and weight on admission was recorded for 46 (9.5%) of 483 patients. Among the 129 patients hospitalized longer than for seven days, weight during the last week was recorded for 18 (14.0%). In total 56 (31.5%) of the 178 patients nutritionally at risk had received some form of nutritional treatment, with adaptations to the eating situation or the normal diet and supplement drinks being the most common treatment measures. Adjusted diet, energy- and nutrient-enriched meals, snacks between meals, enteral and parenteral nutrition were seldom used.

Five themes reflecting barriers the nurses experienced in relation to ensuring adequate nutritional care for the undernourished hospitalized elderly were identified: loneliness in nutritional care, a need for competence in nutritional care, low flexibility in food service practices, system failure in nutritional care, and the neglect of nutritional care. The results imply that nutritional care at the university hospital has its limits within the hospital structure and organization, but also in relation to the nurses' competence. Three themes describing documentation and communication of nutritional information were identified: inadequate documentation of nutritional status on hospital admission, inadequate and unsystematic documentation of nutritional information during hospital stay, and limited communication of nutritional information between hospital and nursing homes.

Documentation of nutritional status and treatment for elderly patients at the hospital was mostly lacking, and nutritional information was seldom communicated properly when the elderly patients were transferred between the hospital and the associated nursing homes.

Conclusion: Overall, this thesis demonstrates that key elements in nutritional care seem to be missing for elderly hospitalized patients, despite the fact that one of two elderly patients were in need of appropriate nutritional treatment to prevent and treat undernutrition. Recommended nutritional care, in line with Norwegian and European guidelines, was not implemented into clinical practice. This suggests that many of the elderly patients were not given adequate nutritional care in line with their needs, which is of imperative clinical and moral concern. There is a clear need, and a high potential, for quality improvement in nutritional care, and the major issues raised in this thesis will be important to consider in such work.

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List of papers

This thesis is based on the following original papers referred to in the text by their Roman numerals:

- I. Eide HK, Šaltytė Benth J, Sortland K, Halvorsen K, Almendingen K. Prevalence of nutritional risk in the non-demented hospitalized elderly: a cross-sectional study from Norway using stratified sampling. *J Nutr Sci.* 2015;4(e0):1-9. doi: 10.1017/jns.2015.8. In press.
- II. Eide HK, Šaltytė Benth J, Sortland K, Halvorsen K, Almendingen K. Are nutritional care practices adequate for elderly hospitalized patients? A cross-sectional study. *J Clin Nurs.* Submitted.
- III. Eide HD, Halvorsen K, Almendingen K. Barriers to nutritional care for undernourished hospitalised older people. *J Clin Nurs.* 2015 Mar;24(5-6):696-706. doi: 10.1111/jocn.12562
- IV. Halvorsen K, Eide HK, Almendingen K. Documentation and communication of nutritional care for elderly hospitalized patients: perspectives of nurses and undergraduate nurses in hospitals and nursing homes. *Scand J Caring Sci.* Submitted.

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List of abbreviations

The following abbreviations are used in the text:

BMI: Body Mass Index

CI: Confidence Interval

ESPEN: The European Society for Clinical Nutrition and Metabolism

ICC: Intra-class Correlation Coefficient

ICD-10: International Statistical Classification of Disease and Related Health Problems 10th revision

MNA: Mini Nutritional Assessment

MNA-SF: Mini Nutritional Assessment Short Form

MUST: Malnutrition Universal Screening Tool

NICE: National Institute for Health and Care Excellence

NRS2002: Nutritional Risk Screening 2002

Nutritional risk: this term refers to both the concepts ‘undernutrition’ and ‘the risk of undernutrition’ in this thesis

RCTs: Randomized Controlled Trials

SD: Standard Deviation

SGA: Subjective Global Assessment

SNAQ: Short Nutritional Assessment Questionnaire

Undergraduate nurses: in this thesis, this concept stands for ‘auxiliary nurses’ and ‘care workers’, which are more used internationally

WHO: World Health Organization

1 Introduction

The growing number of older people in Europe represents a major triumph in medicine and healthcare. However, aging brings its own challenges and problems related to disease and functionality. Not only will the number of older people increase significantly over the next decades, but many will be living much longer with disabilities as well as chronic and multiple diseases (1, 2). Due to these developments, the needs for healthcare services are changing. To meet future demands for healthcare there is an urgent need to develop preventive strategies towards the major health issues in the elderly (1-3). Research on ageing is therefore an area of great social, political and economic importance.

Undernutrition and the risk of undernutrition (nutritional risk) occurs frequently among elderly hospitalized patients, and constitutes a major public health problem in Europe (4-7). While all patients have a basic human right to expect that their nutritional needs are fulfilled during hospital stay (8, 9), several studies from Europe show that undernutrition often is ignored for elderly patients in the hospital setting (6, 7), and Norway seems to be no exception (4, 10, 11). Considering the aging populations in Europe, it can be anticipated that the proportion of elderly patients in hospitals will increase, which further underscores the importance of giving emphasis to issues relating to undernutrition. If left untreated, undernutrition can result in a variety of negative consequences, leading to more suffering for the patients and serious economic implications for the society (12-14). Many elderly patients are already undernourished, or at risk of becoming so, upon hospital admission (15-17), and nutritional status often deteriorates during hospital stay (17, 18). It is therefore important that hospitals prevent and treat undernutrition, as well as ensure that nutritional information is properly communicated between healthcare settings.

This thesis aims to provide knowledge on the current situation of undernourishment in the hospitalized elderly population in Norway by exploring nutritional risk and nutritional care among elderly patients at one large Norwegian university hospital. The prevalence of nutritional risk was estimated. Furthermore, areas important for achieving adequate nutritional care were explored: assessment of nutritional risk, providing patients at nutritional risk with appropriate nutritional treatment, documenting nutritional status and treatment in the patients' medical records, and communicating this documentation between healthcare settings when patients are transferred.

2 Background

2.1 The elderly patients

The starting point of old age cannot be universally defined (19, 20). In most developed countries, the chronological age of 65 years is accepted as a definition of elderly (20). However, in accordance with relevant literature (4, 21, 22) and the increasing life expectancy in Norway, the cut-off of 70 years was used to define an older person in this thesis. The terms ‘elderly’ and ‘older people’ will be used interchangeably throughout this thesis to refer to the patient population studied.

Norway, like many other European countries, has an ageing population. In 2014, the life expectancy for women and men was 84.1 and 80.0 years respectively (23). From 2011 to 2030, the number of people in the age groups 67–79 years and ≥ 80 years is expected to increase by 64% and 56% respectively (3). Although many elderly people are in good health, the risk of disease and disability increases with age. The elderly are therefore frequent users of hospital services and account for a great deal of hospital resources in Norway. About six out of ten adults ≥ 70 years consulted somatic hospitals in 2011 (21). Moreover, general hospitals and somatic institutions accounted for NOK 74 billion in 2011, of which NOK 1 out of NOK 3 was spent on services for the elderly (21). Cardiovascular diseases, injuries, respiratory diseases and cancer were the four most common causes for hospitalization in 2011 (21). Many older people also have several diseases simultaneously, showing chronic and multiple disease pictures (1, 2). This results in complex care needs, and compared to younger age groups, a greater proportion of older people require a multidisciplinary approach to their care. Also, their stays in hospitals are often longer (21).

About 75% of hospitalized patients >80 years old receive municipal healthcare services (1), such as in nursing homes. Moreover, one in five elderly patients are readmitted to the hospital within 28 days (1). One major challenge for the healthcare services is thus to coordinate and integrate care to provide a comprehensive service across healthcare settings. In recent years there has been increased attention on the necessity to strengthen the communication between healthcare settings (24). In Norway the coordination between hospitals and the municipal healthcare services is impacted by the Coordination Reform, which was implemented on 1 January 2012 (1, 2). The intention of the reform is to decrease the average length of hospital stay, and for the municipal healthcare services to take over the responsibility for patients at an earlier stage of the treatment process (1, 2). One of the main

issues in the reform is therefore to improve the coordination of healthcare services and ensure continuity of care for the patients.

2.2 Defining undernutrition

In general, undernutrition can be described as a nutritional deficiency resulting from an imbalance between nutritional intake and requirements. The most common form of undernutrition worldwide is caused by starvation due to catastrophic food shortages, for example in settings of conflict or natural disaster (25). In this thesis, the form of undernutrition associated with illness or disease happening in the clinical setting in developed countries is investigated, often referred to as disease-related undernutrition (malnutrition) (13, 25).

Currently, there is no clear consensus on a definition or gold standard method for identifying undernutrition (13, 25-29). Moreover, the terms ‘undernutrition’ and ‘malnutrition’ are often used interchangeably in relevant literature, although malnutrition includes both undernutrition and overnutrition, in addition to specific nutrient imbalances (13, 26). Therefore, in this thesis we chose to use the term ‘undernutrition’. The following definition of malnutrition presented by Stratton in 2003 is widely acknowledged (13, page 3): ‘A state of nutrition in which a deficiency, excess or imbalance of energy, protein, and other nutrients causes measurable adverse effects on tissue/body form (body shape, size and composition) function, and clinical outcome’, whereby undernutrition is a part of the deficiency. However, this definition does not include the term ‘inflammation’. In a Delphi study from 2010 including 22 well-known experts in the field of clinical nutrition, the elements ‘deficiency of energy’, ‘deficiency of protein’ and ‘decrease in fat-free mass’ were most often mentioned to be particularly important in defining undernutrition (26). In addition, ‘function’ and ‘inflammation’ were suggested to be important (26). Over the past decade, it has become increasingly evident that the pathophysiology of undernutrition associated with disease or injury also incorporates varying degrees of acute or chronic inflammation (25, 28). The inflammatory response increases the patient’s nutritional requirements by elevating energy expenditure and nitrogen excretion in a situation of stress metabolism (25, 26, 28). An International Guideline Committee constituted to develop a consensus approach to defining undernutrition (while using the term malnutrition) syndromes for adults in the clinical setting recently (2010) proposed an etiology-based approach by incorporating inflammation: ‘Starvation-related malnutrition’, when there is chronic starvation without inflammation (e.g. anorexia nervosa), ‘chronic disease-related

malnutrition', when inflammation is chronic and of mild and moderate degree (e.g. pancreatic cancer), and 'acute disease or injury-related malnutrition', when inflammation is acute and of severe degree (e.g. major infection) (25).

2.3 Undernutrition in elderly patients

2.3.1 The prevalence of undernutrition

Undernutrition and the risk of undernutrition occurs frequently among elderly patients in the hospital setting. This is the case in Norway (4, 5, 14, 22, 30), as well as the rest of Europe (6, 7, 15, 16, 31-34), and has been an issue for many years (35, 36). Undernutrition and the risk of undernutrition also occurs among older people in the community setting, particularly in nursing homes (37-40) and the homecare services (41-43), where diseases and disabilities are common. Many elderly patients are therefore already undernourished, or at risk of becoming so, on hospital admission (15-17). Furthermore, since nutritional status often deteriorates during hospital stay (17, 18), many will be at risk of undernutrition or still be undernourished, when discharged from hospital. This requires further nutritional follow-up in the community.

Many studies have emphasized the presence of undernutrition and the risk of undernutrition in the hospitalized elderly population (4-7, 14-16, 22, 30-34). However the extent of the problem is not well described in relevant literature and there is a lack of accurate prevalence data in Europe and Norway. Many of the studies conducted are based on small or narrowly defined hospital populations, or have not used optimal statistical sampling methods when collecting data, all of which affects the prevalence estimates in an unfavorable way. Besides, different measurement methods are often employed as there is currently no clear consensus for a gold standard method. The exact prevalence in Europe is therefore currently unknown, and studies reporting the prevalence of undernutrition and the risk of undernutrition have consequently shown varying rates (Table 1). In Norway, estimates between 50% and 75% have been reported in a few older studies (4, 22, 30). In a recently (2014) published study from a Norwegian university hospital, Tangvik et al. showed an overall prevalence of 29% for the entire adult hospital population, of which 532 (38.3%) of the 1 389 elderly aged ≥ 70 years were undernourished or at risk of becoming so (14). Of the elderly aged ≥ 80 years, 40.4% were affected (5). However, to our knowledge, no adequately designed prevalence study has previously been conducted exclusively on elderly patients admitted to hospital in Norway.

Table 1. Some European studies reporting prevalence estimates on undernutrition and the risk of undernutrition for the hospitalized elderly

Reference, year:	Sample size (N) and setting:	Methods and estimates:
Holst et al., 2012 (31)	N: 233 \geq 65 yrs, 3 hospitals, medical gastroenterology, geriatrics wards	MNA ¹ : 68% at risk and undernourished MUST ² : 47% at risk and undernourished NRS2002 ³ : 54% at risk and undernourished
Imoberdorf et al., 2010 (15)	N: 32837, number of elderly not specified, 7 hospitals, internal medicine wards	NRS2002 ³ : 65-84 yrs: 22% at risk and undernourished, >85 yrs: 28% at risk and undernourished
Lucchin et al., 2009 (16)	N: 1284, elderly: 561 \geq 65 yrs, 13 hospitals, >11 medical, 10 surgical wards	NRS2002 ³ : 41.9% at risk and undernourished
Söderström et al., 2013 (33)	N: 1771 \geq 65 yrs, 1 hospital, internal medicine, surgical, orthopedic wards	MNA ¹ : 55,1% at risk, 9.4% undernourished
Pirlich et al., 2006 (32)	N: 1886, elderly: 697 \geq 70 yrs, 13 hospitals, >9 wards	SGA ⁴ : $>43\%$ undernourished of which 16.7% severely undernourished
Vanderwee et al., 2010 (34)	N: 2329 \geq 75 yrs, 90 hospitals, elderly wards	MNA ¹ : 43% at risk, 33% undernourished
Vanderwee et al., 2011 (6)	N: 2094 \geq 75 yrs, 140 elderly wards	MNA ¹ : 36.2% at risk, 31.9% undernourished
Volkert et al., 2010 (7)	N: 205 \geq 75 yrs, 1 hospital, geriatric ward	MNA ¹ : 60.0% at risk, 30.2% undernourished SGA ⁴ : 34.6% moderately, 25.4% severely undernourished

¹MNA: Mini Nutritional Assessment, ²MUST: Malnutrition Universal Screening Tool, ³NRS2002: Nutritional Risk Screening 2002, ⁴SGA: Subjective Global Assessment.

2.3.2 Risk factors for undernutrition

Undernutrition may result from one or more of the following: reduced nutritional intake, increased nutritional requirements or losses, and impaired ability to absorb or utilize nutrients (12, 13, 44, 45). The causes are often multi-factorial and interrelated. For ill or diseased elderly, a variety of physiological, psychological and social changes associated with ageing interact with disease processes, making the elderly particularly vulnerable to undernutrition (46-48).

A reduced nutritional intake is often seen in combination with disease or injury (12, 13, 44, 45, 49). Data from the European Nutrition Day study showed that 60% of the hospitalized patients did not eat their full regular meals (49). Pain or side effects of treatments, such as nausea and vomiting, are common causes of reduced food intake. Moreover, many ill patients experience a general loss of appetite. For older people, the aging process itself is associated with a reduction in both appetite and food intake, often referred to as ‘the anorexia of aging’ (46, 47). This normal physiological process happens to

counterbalance the decline in physical activity and metabolism that occurs with aging, and are caused by, for example, impaired function of senses such as taste and smell, alternations in the gastrointestinal functioning and earlier satiety (46). On top of this, many elderly experience disability, oral and swallowing problems, cognitive impairment and loneliness, which further contribute to reduced food intake and increase the risk of undernutrition (46).

Disease processes themselves may also lead to undernutrition, by increasing the patients' nutritional requirements or losses, or by impairing the ability to absorb or utilize nutrients (12, 13, 44, 45). As mentioned earlier, a varying degree of chronic and acute inflammation is often present during diseases and injuries, causing a state of stress metabolism or hypermetabolism, which leads to a catabolic breakdown of the body (25, 26, 28, 45). This artificially increases the patients' nutritional requirements, particularly for protein in order for the body to heal itself. Diseases often associated with undernutrition include chronic obstructive pulmonary disease, chronic kidney failure, chronic heart failure, cancer and inflammatory bowel disease (5, 12, 32) – all of which are commonly seen in older people. Moreover, chronic and multiple disease pictures put them at particular risk (12, 13). Diseases and injuries may also result in increased nutritional losses that further increase their risk of becoming undernourished, caused by for example vomiting, diarrhea or fistulae (45). Moreover, an impaired gastrointestinal function causing difficulties in digestion and absorption of nutrients may also increase the risk of undernutrition (12, 13, 45). For instance, among patients undergoing abdominal surgical procedures, varying degrees of intestinal failure may occur.

2.3.3 Consequences of undernutrition

Undernutrition can adversely affect every organ system in the body (13), with potentially serious clinical and economic consequences if it remains untreated (12-14, 44). The extent of the consequences are related to the duration and degree of nutritional deficiency and the patients' current health status. For the elderly, for whom body fat and lean body mass are already diminished due to aging (46), nutritional deterioration may occur more rapidly during episodes of acute disease or injury. Moreover, older adults are less able to recover their nutritional status after episodes of stress compared to younger adults (48, 50, 51).

Undernutrition is not only a cause of disease and injury, but also leads to an increased morbidity rate in chronic and acute diseases and injuries (12, 14). Consequences such as an impaired immune function, delayed wound healing and recovery from illness, and decreased functional status are the main contributors for the increased morbidity rate

(12, 44). Also, undernourished patients often become apathetic and depressed (52), which may lead to a loss of will to recover. The increased morbidity rate results in increased mortality, greater complications and longer hospital stays, adding to the suffering of patients and reducing quality of life (12, 14, 44, 53, 54). In a study of elderly hospitalized patients, Feldblum et al. found that the undernourished patients, and those at risk of becoming so, had longer hospital stays compared to the well-nourished (7.1 versus 5.0 days on average) (54).

Undernutrition has not only been shown to be associated with adverse in-hospital consequences, but also with pre-admission and post-discharge consequences, like increased need for re-hospitalization, nursing home admission and help from homecare services (5, 13, 14, 53, 55, 56). In a prospective study among elderly hospitalized patients, Sullivan et al. found a higher risk of mortality within 90 days of admission, as well as an increased probability of functional dependency at hospital discharge (55). Moreover, a study based on a data analysis from the United Kingdom National Diet and Nutrition Survey, found that elderly at high risk of undernutrition had a greater risk of being admitted to hospital than those at low risk (56). In this way, untreated undernutrition results in an ‘undernutrition carousel’, in which patients tend to move between healthcare settings (57, 58).

Altogether, these serious clinical consequences result in increased healthcare costs for the society (12, 13, 44, 59). In a recent cost-illness analysis from the Netherlands in all healthcare settings, the costs of managing undernutrition for adults was estimated to be GBP 1.9 billion (59). The cost for adults >60 years was four times larger than for patients in the age group 18–60 years (59). In Norway, a cost-benefit analysis showed that targeted prevention and treatment of undernutrition in hospitals can contribute to a savings in specialist healthcare of about NOK 800 million a year (60).

2.4 Prevention and treatment of undernutrition

2.4.1 Nutritional care for elderly patients

Undernutrition and its associated negative consequences can be prevented or reversed, if adequate nutritional care is provided for the patients (27, 61, 62). For older people who are ill or have diseases and are at particular risk of becoming undernourished, this is of great importance and may be beneficial with regard to both health and financial issues. Moreover, according to the Norwegian Patients’ Rights Act (8), based on international human rights (9), all patients have a basic human right to receive treatment and care according to their needs. Elderly patients therefore have a right to expect their nutritional needs to be fulfilled,

which further strengthens the importance of preventing and treating undernutrition for older people. Hospitals, nursing homes and homecare services all play key roles in this work. However, the focus of this thesis is limited to addressing nutritional care for elderly patients in the hospital setting, as well as to the communication of nutritional information between hospitals and nursing homes.

Despite the importance of preventing and treating undernutrition in elderly patients, European studies demonstrate that this condition often is ignored in the hospital setting, and that the identification, treatment and documentation of undernutrition and the risk of undernutrition often is poor (6, 7, 63-65). The results from a Belgian nation-wide cross-sectional study from 2011 revealed a rather low quality of nutritional care for elderly aged ≥ 75 years at geriatric wards (6). Norway seems to be no exception (4, 10, 11). In a study published in 1991 Mowe et al. showed that under half of the undernourished elderly admitted at medical wards in a Norwegian hospital were identified as undernourished at hospital admission, and that only five (7.6%) of these 66 undernourished elderly received nutritional treatment (4). Moreover, a nationwide survey of elderly patients with hip fractures, conducted by the Norwegian Board of Health Supervision in 2011–2012, indicated a lack of proper nutritional care as the patients' nutritional situation and treatment were inadequately documented in medical records and rarely communicated in discharge letters (10, 11). However, there is a limited body of research available today exploring how undernutrition is addressed for elderly patients in the hospital setting in Norway. Moreover, to our knowledge, there is a lack of studies assessing how nutritional care is documented in hospitals for elderly patients, and there is a need to discover how nutritional information is communicated when elderly patients are transferred between healthcare settings.

2.4.2 Guidelines on prevention and treatment of undernutrition

In recent decades, there has been a growing awareness of undernourishment in the healthcare sector in Europe (66), as reflected by a number of organizations and national authorities such as The European Society for Clinical Nutrition and Metabolism (ESPEN) (62, 67), the Council of Europe (68-70), the National Institute for Health and Care Excellence (NICE) (71) and the Dutch Malnutrition Steering Group (72) that have published guidelines on nutritional care in this field. In Norway, the Directorate of Health published national professional guidelines on prevention and treatment of undernutrition for the first time in 2009 (57). The purpose of these guidelines is to help to ensure a good quality of prevention and treatment of undernutrition in the healthcare sector, and the target group is

healthcare professionals and leaders in all healthcare institutions and in open care, such as hospitals, nursing homes and homecare services (57). In line with the European guidelines (62, 67, 71), they focus on four key recommendations (Table 2) that are to be implemented into clinical practice (57). With these guidelines, the Directorate of Health aims to ensure that undernourished patients, and patients at risk of becoming so, are properly identified and treated. In this thesis, these four key recommendations define adequate nutritional care for elderly patients.

Table 2. The four key recommendations emphasized in the Norwegian national professional guidelines on prevention and treatment of undernutrition (57, page 3)

1. To assess nutritional risk
2. To provide patients at nutritional risk with appropriate nutritional treatment
3. To document nutritional status and treatment in the patients medical record
4. To communicate this documentation to the next level of care

Regarding hospitals, the guidelines state that all patients must be screened for nutritional risk on admission to hospital and subsequently on a weekly basis, and that patients running a nutritional risk must be given appropriate nutritional treatment (57). Information on the patients' nutritional status and treatment must also be documented in medical records and be communicated between healthcare settings, when for example patients are transferred from hospitals to nursing homes or have acute or planned hospitalizations from nursing homes. The recommendations regarding assessment of nutritional risk and documenting of information on nutritional status in the patients' medical records must be performed for meeting the requirements for professional conduct for health personnel, as regulated by the Norwegian Personnel Act §4 (73, 74). Consequently, these recommendations are mandated by law (57).

2.4.3 Nutritional risk screening

Nutritional risk screening is a central first step in the prevention and treatment of undernutrition (57, 61, 67, 71). The goal of such screening is to predict the probability of a better or worse outcome due to nutritional factors, and whether nutritional treatment is likely to influence it (62). The screening process not only identifies patients that already are undernourished, but also patients not undernourished at the time, but at risk of becoming so. The term 'nutritional risk' therefore refers to both the concepts 'undernutrition' and 'the risk of undernutrition'. Undernutrition is easier to prevent than to treat, and it is therefore highly

important to identify the condition as early as possible. This is especially true for older people (18, 48, 50).

Routine screening of all patients for nutritional risk ensures that priority rapidly can be given to patients whose health condition most likely will benefit from nutritional treatment (61). The importance of conducting nutritional risk screening upon hospital admission is stressed by the fact that many patients, and especially elderly patients, are already nutritionally at risk before hospital admission (15-17). Furthermore, since nutritional status often deteriorates during the hospital stay, re-screening must be conducted on a weekly basis (17, 18). This is particularly important for elderly patients as they become undernourished more rapidly than younger adults do (46-48).

For use in the hospital setting, a variety of nutritional risk screening tools have been developed and published (75, 76). There is a continuing debate in the literature regarding the tools that should be used. This is related to the current lack of a gold standard method for identifying undernutrition. In the Delphi study from 2010, the elements 'involuntary weight loss', 'no food intake', and 'body mass index' (BMI) were mentioned by the experts as important in the operationalization of undernutrition (26) and are found in most screening tools (27). Another important element mentioned by the experts was the 'acute disease effect' (26), which also is accounted for in some screening tools (27). In hospitals, where disease-related stress metabolism may increase the patients' nutritional requirements, screening should be performed by considering both nutritional status and the severity of disease (27, 62). In this way, indications for nutritional treatment are not only a matter of nutritional status (77). A screening tool needs to be quick and simple to use (61), and the accuracy of the tool is important (27, 62). However, since there is currently no gold standard method, there is also a lack of a reference method to evaluate different screening tools (61). Consequently, the screening tools are often evaluated against each other, which represents a major limitation in the validation of such tools (75).

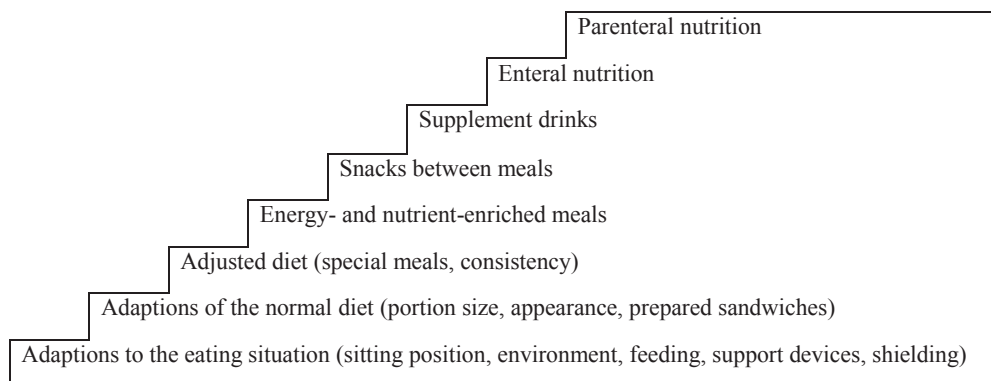
The most frequently used screening tools for the general adult hospital population in Europe include the Malnutrition Universal Screening Tool (MUST) (78), the Nutritional Risk Screening 2002 (NRS2002) (79), the Subjective Global Assessment (SGA) (80), and the Short Nutritional Assessment Questionnaire (SNAQ) (81). While the Mini Nutritional Assessment (MNA) (82) and its short form (MNA-SF) (83) have been developed specifically for elderly patients, the NRS2002 and SGA both account for older age (79, 80). In Norway, the NRS2002 is most frequently used in the hospital setting (84).

2.4.4 Nutritional treatment

When a patient screens positive for nutritional risk, a treatment plan must be developed to establish severity and to consider appropriate nutritional treatment for that patient (57, 62, 67, 70, 71). In many cases, this process should be based on a more detailed nutritional assessment (29, 57, 62). Nutritional assessment is a more comprehensive evaluation of metabolic, nutritional and functional variables, like side effects of medical treatment, anthropometric measurements, food intake, mobility and stress metabolism (29, 57, 62). For elderly patients, factors related to aging, such as dental status, chewing or swallowing problems and ability to feed themselves, need to be considered in addition. The treatment plan must specify the patients' nutritional status, intake and needs, and must be accompanied by carefully selected and individually targeted nutritional treatment measures (29, 57, 67). The goals of the treatment should also be specified in the treatment plan, in addition to a schedule for starting, monitoring and stopping the treatment (57). The effectiveness of the treatment should be evaluated by defined measurements and observations specified in the treatment plan (57, 62, 71), by, for instance, monitoring the patients' food intake and recording this properly to know what is actually consumed.

Nutritional treatment measures should always be implemented in the order of priority outlined in the Norwegian professional guidelines' 'nutritional ladder' (Figure 1), to prevent or delay the use of more costly treatment when cheaper measures would be sufficient (57). The simplest and cheapest way to provide nutritional treatment is to get the patients to eat more of the hospital food, either by adapting the normal diet or by serving adjusted diets, snacks in between meals, or energy- and nutrient-enriched meals (57, 67, 85). Additionally, it is important to properly facilitate the eating situation (57, 85). However, some patients struggle to meet their nutritional requirements through the hospital food alone, and supplement drinks and artificial nutrition should be provided, in addition or as a substitute (57, 67, 85, 86). It may therefore, in some cases, be necessary to start at a higher level or jump several levels up on the 'nutritional ladder' during the course of treatment (57). The patients should also be informed about their treatment and be given the opportunity to discuss different treatment options (67). Moreover, they should be encouraged to regard 'nutrition and eating' as an important part of their medical treatment.

Figure 1. The nutritional ladder, modified from the Norwegian national professional guidelines on prevention and treatment of undernutrition (57, page 19)



Nutritional treatment, when appropriately targeted, can produce various clinical benefits as concluded in a variety of systematic reviews and meta-analyses (13, 86-90). In a combined meta-analysis of oral nutritional supplements and enteral nutrition studies across different healthcare settings and patient groups, including the elderly, Stratton found significant reductions in mortality and complications rates, as well as a reduction in length of hospital stay in most studies (13). Although the evidence base for the effects of nutritional treatment has been strengthened in recent years, this applies mainly to supplement drinks, enteral nutrition and parenteral nutrition (13, 62, 91). There is, however, a need for more adequately designed studies to properly assess the impact of nutritional treatment on patient outcome, especially with regard to the first steps of the nutritional ladder (13, 91).

2.4.5 Documentation and communication of nutritional information

Documentation of nutritional status and treatment in a patient's medical record is an important part of adequate nutritional care, and must therefore be implemented in a hospital's current documentation systems (57, 62, 74). Proper documentation is a prerequisite for ensuring that all personnel involved in the patients' treatment have the necessary information so the health facility can provide professionally adequate treatment, as regulated by the Specialist Health Care Services Act §§ 2-2 and 3-2 (92) and the regulations concerning the patients' medical records (93). To ensure adequate follow-up of the patients' nutritional needs during hospitalization, each step in the process of nutritional care should be continuously documented, in the same way as any other part of the patients'

medical treatment (67). In Norway today there exists no national standard for documenting information on nutritional status and treatment in a patient's medical record (94).

A patient's medical record is defined as a collection of all the information about the patient's disease and relevant health conditions that are documented by authorized healthcare professionals who have provided healthcare services (95). All healthcare services must be documented (73), meaning that services not documented can be considered not performed. In addition to indicating planned or given healthcare services, medical records are also a working tool for healthcare professionals. This means that the information documented must be structured and systematized so that it can be viewed in a logical context for all who follow the patient (95). Moreover, the information documented should be important and substantially satisfying, in other words, it should not include irrelevant information (95). In recent years documentation has shifted from paper-based to electronic systems in Norwegian healthcare services (95), which was expected to facilitate structure, clarity and comprehensiveness (96). However, research shows the potential of electronic patient records is often not fully utilized today (96, 97).

When patients are transferred between healthcare settings, those responsible for their treatment are to be informed about the patients' nutritional status and treatment (57, 62, 67, 74). Unless a patient objects to the exchange of information, healthcare professionals have an obligation to communicate further the information other healthcare professionals might need in order to provide adequate treatment, as regulated by the Norwegian Personnel Act §§25 and 45 (73). Moreover, healthcare professionals in hospitals are obligated to give the municipal healthcare services necessary advice and guidance regarding patients' health conditions (74, 92). This is essential for ensuring continuous treatment of patients, so that their nutritional needs can be followed-up, which is one of the main issues in the Coordination Reform (1, 2). For elderly patients, many of whom are in and out of hospital regularly, this becomes particularly important.

Healthcare professionals working in hospitals and municipal healthcare services, like nursing homes, are dependent on each other when patients need follow-up across healthcare settings (95). In this, good communication is essential. When patients are discharged from hospital, discharge summaries containing relevant information from the patients' medical records and recommendations for follow-up must be communicated (95). Likewise, when patients are hospitalized, information of importance for care provision must be communicated, in addition to referral notes written by the referring physicians. So far, most of the communication between hospitals and the municipal healthcare services occurs in

writing or by telephone (98). However, use of electronic communication is being expanded in the Norwegian healthcare services, and is expected to contribute to a more effective flow of information (99).

2.4.6 Nutritional care management

As elaborated above, nutritional care is a concept including several steps ensuring that undernourished elderly patients, and those at risk of undernutrition, are identified and treated according to their nutritional needs (57, 62, 67). Success depends on careful management supported by an effective infrastructure, and the recommendations on conducting nutritional risk screening, initiating appropriate nutritional treatment, and documenting and communicating nutritional information should therefore be implemented in every department and ward (57, 67).

In order to effectively prevent and treat undernutrition in the hospital setting, five essential measures have been defined: 1) clearly defined responsibilities in planning and management of nutritional care; 2) educating and training hospital staff about nutrition; 3) patients' influence on and knowledge of nutritional care; 4) cooperation and communication among all staff groups; and 5) the involvement of the hospital management (69, 70). These measures were defined as major barriers to proper food service and nutritional care in European hospitals as early as in 2001, in a nation-based survey conducted by the Council of Europe; Norway was among the eight countries included into the survey (69, 70). Integrating nutritional care into hospital clinical practice has, however, proved to be challenging in several European countries, although certain improvements have taken place (84, 100-103). A cross-sectional study conducted in a Norwegian university hospital showed that the implementation of a nutrition strategy improved overall screening performance, but that the number of patients receiving nutritional treatment did not increase (84). Moreover, a questionnaire-based study published in 2006 investigating nutritional care practices among physicians and nurses in different hospital settings in Scandinavia showed an overall poor standard of nutritional care, compared to the recommendations proposed by ESPEN (101). There were, however, several differences between the countries, and nutritional risk screening and treatment was generally more appreciated and focused in both Sweden and Denmark compared to Norway (101). Also, in Denmark, a recently (2014) published follow-up to the questionnaire-based study found significant improvements compared to the last assessment (104). There seems to be a discrepancy between nutritional practice and attitudes among nurses and physicians working in Scandinavian hospitals (101, 105, 106).

Despite being considered important, recommended nutritional practice is often not carried out. Holst et al. found that 90% of the nurses in their study had a self-reported positive attitude towards nutritional risk screening, even though only half the nurses actually found it to be a general task undertaken on their wards (105). Furthermore, a finding of the same study showed that the documentation of nutritional treatment plans in the patients' medical record was given high priority among the nurses, but that this was rarely carried out in clinical practice (105).

Traditionally, nutrition has been a nursing responsibility as a part of caring for the patients' basic needs (107, 108). Today, nutrition generally is a multidisciplinary field within several hospital professions, involving the participation of physicians, nurses, clinical dietitians and food service staffs, amongst others (67, 69, 109, 110). However, the role of each profession is not always clearly defined (109). The Norwegian Directorate of Health has laid out the assignment of nutritional responsibility and distribution of tasks in the 'Diet and Nutritional Care Manual' (Kosthåndboken), which serves as a guide on nutrition for the Norwegian healthcare services (111). According to the manual, physicians have the overall responsibility for ensuring that patients receive adequate nutritional care, whereas nurses often are responsible for identifying and evaluating patients' nutritional status, including conducting nutritional risk screening and making referrals to other relevant healthcare professions, like clinical dietitians. The development of a nutritional treatment plan is often the result of a multidisciplinary approach, but is still the physician's overall responsibility. Nevertheless, by being with the patients in a 24/7 context, the nurses play an important role in identifying the need for nutritional treatment, implementing appropriate nutritional treatment measures, and evaluating the effectiveness of the treatment (110, 111). Moreover, nurses represent the largest group of healthcare professionals working in hospitals, meaning they have a key role in implementing the recommended nutritional care in daily clinical practice. Research to explore the barriers that nurses meet in their daily work with elderly hospitalized patients suffering from undernutrition and the risk of undernutrition are thus considered highly relevant. To our knowledge, few studies with a qualitative methodology have researched this, and no such study has previously been conducted in Norway.

3 Aims

The overall aim of this thesis was to explore nutritional risk and nutritional care among elderly hospitalized patients in Norway, with focus on the communication of nutritional information between hospitals and nursing homes.

Beforehand, we hypothesized that the prevalence of nutritional risk was high and that the quality of nutritional care was inadequate. Moreover, we hypothesized that information on nutritional status and treatment is not optimally documented in hospitals, nor is it communicated when elderly patients are transferred between healthcare settings. The specific aims of this thesis are the following:

1. To estimate the prevalence of nutritional risk in the hospitalized elderly patients by using stratified sampling along with adequate power calculations (paper I).
2. To assess nutritional care practices used in identifying and treating nutritional risk in hospitalized elderly patients (paper II).
3. To identify what nurses experience as barriers to ensuring adequate nutritional care for undernourished hospitalized older people (elderly¹) (paper III).
4. To identify how nurses document information on nutritional status and treatment of elderly patients in hospitals and how nurses and undergraduate nurses communicate nutritional information when elderly patients are transferred between hospitals and nursing homes (paper IV).

¹Paper III was edited for language and terminology by the Journal of Clinical Nursing, and 'elderly' was consequently replaced by 'older people'

4 Material and methods

4.1 The overall study design

This thesis has employed a mixed methods research design, combining quantitative and qualitative research methods (112-114). Mixed methods research design represents an approach that involves the collection, analysis and interpretation of both quantitative and qualitative data in a single study or in a series of studies to investigate the same underlying phenomenon (112-114). In this thesis, one cross-sectional study (quantitative part) and two focus group sub-studies (qualitative part) were designed and carried out. A convergent parallel mixed methods approach, as identified by Creswell, was applied (112, 115). In this type of design, the quantitative and qualitative data are collected in parallel and analysed separately (112, 115). The point in time where mixing occurs is when the results are compared and synthesized at the end, and the researcher reflects upon what is learned from the combination of both methods (112, 115). These reflections are outlined in the discussion section (section 6.2) of this thesis.

Today, the worldview most often applied in mixed methods research design is that of pragmatism (112, 114-116). Pragmatism is not committed to any one system of philosophy and reality. Instead the researcher is free to choose whatever methods are best suited for their research (112, 116). While quantitative methods can tell us about the scope, distributions and comparisons between groups, qualitative methods on the other hand allow for knowledge of properties, content and character (112, 115). Quantitative understanding arises from assessing the responses of a large number of people to a few variables, while qualitative understanding on the other hand arises from studying a few individuals and exploring their perspectives in great depth (112, 115). The rationale for collecting both quantitative and qualitative data in this thesis is to provide a more complete understanding by exploring nutritional risk and nutritional care among the hospitalized elderly from different perspectives (112, 115, 117). Another goal was to determine whether there were similarities or differences in the results, allowing for validation and confirmation of the collected data (112). An overview of the studies and papers on which this thesis is based are shown in Table 3.

Table 3. An overview of the studies and papers on which this thesis is based

Type of study:	Study design:	Setting:	Data collection:	Paper:	Aim:
Quantitative	Cross-sectional design	University hospital	Main study: 173 nursing students screened 508 elderly patients for nutritional risk and collected data on nutritional care practices on 20 somatic wards	I	To estimate the prevalence of nutritional risk in the hospitalized elderly patients by using stratified sampling along with adequate power calculations
			Pilot study: 290 elderly patients, 96 nursing students Inter-rater agreement study: 30 elderly patients	II	To assess nutritional care practices used in identifying and treating nutritional risk in hospitalized elderly patients
Qualitative	Focus group design	Sub-study I: University hospital	Main study: Four focus groups with 16 nurses working in seven somatic wards, discussing nutritional care Pilot study: One focus group with five nurses	III	To identify what nurses experience as barriers to ensuring adequate nutritional care for undernourished hospitalized older people
		Sub-study II: Five (six) ¹ Nursing homes associated with the university hospital	Main study: Five focus groups with 27 nurses and undergraduate nurses in short- and long-term units, discussing nutritional care Pilot study: One focus group with five nurses and undergraduate nurses	IV	To identify how nurses document information on nutritional status and treatment of elderly patients in hospitals and how nurses and undergraduate nurses communicate nutritional information when elderly patients are transferred between hospitals and nursing homes

¹The sixth nursing home was included in the pilot study.

4.2 Preconceptions

The perspective or position of the researcher shapes and motivates all research in some way, and diverse and equally valid understandings of the topic under study might develop (117).

Understanding something about these perspectives and positions is relevant in quantitative research, but is particularly important in qualitative research, where the researcher serves as an instrument in generating and analysing the data (117, 118).

As a newly educated clinical dietitian, I entered this field with a great interest in nutrition and its importance and relevance in disease treatment. Moreover, during my education, I became increasingly interested in undernutrition in elderly patients, partly from writing my Master's thesis on undernutrition and length of overnight fasts among elderly nursing home residents, and partly from working as a part-time care assistant in the homecare services. I have therefore seen in practice how easily undernourishment can develop in elderly patients, and I have myself experienced different challenges in providing adequate nutritional care during busy working days. However, since I have never worked as a clinical dietitian or otherwise in a hospital, I met this setting with an open mind. In this thesis, I remain aware of my preconceptions and acknowledge that my position affected the entire research process, from study design to the final writing phase.

My main supervisor (project leader) is a professor and clinical dietitian, with experience from the hospital setting and research projects. The first co-supervisor (the focus groups assistant) is an experienced intensive care nurse. She has a PhD in medical ethics and experience from research on elderly patients. The second co-supervisor is a professor, and a statistician with experience from research in the hospital setting. The third author in papers I and II, who was central to this research project, is an experienced nurse (MNSc) and nursing lecturer. She has published a book on nutrition for nursing students (119) and was involved in the pilot study for the cross-sectional study. The perspectives and positions of my supervisors and the co-authors have influenced both me and the entire research process through discussions, conversations and co-authorship.

4.3 Setting

The cross-sectional study was carried out at a university hospital in Norway. The first focus group sub-study was conducted in parallel at the same hospital (sub-study I), while the second was conducted in municipal nursing homes accepting patients from and transmitting patients to the university hospital (sub-study II).

The university hospital provides healthcare services for about half a million people living in urban and rural municipalities, thus covering about 10% of the Norwegian population. The patient population is heterogenic with respect to ethnicity and socioeconomic factors, and can be considered representative of Norwegian society. The

hospital operates as both a local and regional public hospital, thereby offering locally based specialist healthcare services as well as services that are more specialized. The food service uses a cold chain principle organized by way of several ward kitchens receiving food transported from the central kitchen. Numbers provided by the analysis department of the hospital show that in 2012 and 2013, the average length of stay for elderly patients aged ≥ 70 years was 5.7 and 5.5 days, respectively.

The participating nursing homes were located in different urban and rural municipalities, and therefore cover a heterogenic population with respect to ethnicity and socioeconomic factors. In Norway, nursing homes generally provide short- and long-term care to people who are no longer able to take care of themselves or cannot be taken care of by others at home because of disease or disability. The number of residents in the participating nursing homes varied between 78 and 148.

4.4 Quantitative part (papers I, II)

4.4.1 Study design

The cross-sectional study was developed with multidisciplinary cooperation between the researchers, the collegium at a bachelor nursing education program, representatives from the university hospital and other experts in the field. Second-year nursing students at the university college in question undergoing their acute and clinical care practice studies on somatic wards at the university hospital collected data on nutritional risk and nutritional care practices among elderly patients. Cross-sectional studies are well suited to assess the burden of disease or healthcare needs of a given population (120), like the elderly hospitalized population. In this study, data on one set of observations were collected for every individual in the study population, at a certain point in time, disregarding the length of time of the study as a whole (120). Based on these observations, the prevalence of nutritional risk was estimated (Paper I) and the nutritional care practices used in identifying and treating nutritional risk were assessed (Paper II).

4.4.2 The bachelor nursing education program

The nursing students were in their second year of a bachelor's nursing education program which has a particular focus on nutrition. Therefore, the screening of hospitalized elderly patients for nutritional risk and collecting data on nutritional care practices on the different wards were important parts of the students' clinical training and education. During the first study year, the students were taught about undernutrition, and got valuable training in using

nutritional risk screening tools, measuring weight and height of patients, calculating BMI and recent weight loss as well as providing energy- and nutrient-enriched meals. Involving students in research activities is also an important strategy of the university college, strengthening evidence-based practice. To meet the substantial challenges related to undernourishment in the hospital setting, it is vital that nursing students receive proper education and training in nutritional risk screening. By participating in this study, the students gained first-hand experience and increased their awareness of the occurrence of nutritional risk and how recommended nutritional care is performed for elderly patients on the participating hospital wards. They also acquired insight into how a large multidisciplinary research study is planned and carried out. Several of the persons central to planning and conducting this study were experienced in using nursing students for the collection of research data (121, 122), which simplified the data collection.

4.4.3 Sample selection

In total 14 out of 16 medical and surgical somatic wards at the university hospital were included in this study. Additionally, one rehabilitation ward, one specialized short-term unit, one emergency medicine ward (observation ward), and one cardiac monitoring ward were included. Two wards were split into two sub-wards due to differences in the patients' diagnoses. It was reasonable to assume that each of the 20 non-overlapping wards represented homogeneous sub-groups of the patient population. Data on the elderly patients were therefore collected by using a proportional stratified sampling technique (120, 123), with the wards defined as strata (Figure 2). Consecutive sampling was applied within each stratum, by including all eligible elderly patients available. Stratified sampling is a preferred technique when sub-groups in a population differ considerably (120, 123), like for example in hospitalized populations. Stratified sampling technique improves the representativeness of the sample by reducing sampling error (123). In this way, more precise estimates can be obtained (123). A statistician (second co-supervisor) was responsible for the statistical sampling design.

4.4.4 Selection of participants

Nine nutritional screening days were implemented in the academic years 2011/2012 and 2012/2013 (Figure 2). In total 173 students collected the data. The screening days were Tuesdays, Wednesdays and Thursdays to ensure a steady coverage of patients, as most patients are admitted on Mondays and discharged on Fridays. To account for possible

seasonal variations, the screening was performed in April, May, September, November and December.

Figure 2. Study design for the cross-sectional study

20 wards (strata)																	
Cardiac monitoring	Cardiology Medicine	Ear-Nose-Throat/Gynaecology	Emergency Medicine	Gastro Surgery lower	Gastro Surgery upper	Haematology	Heart Medicine	Infectious Medicine 1	Infectious Medicine 2	Vascular/Thorax	Lung Medicine	Neurology + Endocrinology	Neurology/stroke	Urology	Orthopaedics 1	Orthopaedics 2	Specialized short time unit
																	Rehabilitation neurology
																	Renal Medicine
The elderly patients were proportionally selected from each ward																	
Academic year 2011/2012 (87 students)									Academic year 2012/2013 (86 students)								
Day 1	Day 2	Days 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9									

All elderly (≥ 70 yrs) patients admitted on the included wards at 08.00 am on the screening days were asked to participate. Terminal patients, i.e. patients assumed short-lived (less than one month), and patients diagnosed with dementia were excluded. In addition, patients experiencing language difficulties, patients that were scheduled for operations or examinations at the time of the screening and were therefore not present were also excluded, as were patients that were found unfit to participate, for instance due to unconsciousness or having contagious diseases. Eligible patients were selected by the students in cooperation with the ward nursing staff. The students noted information on participation status (Appendix 2).

4.4.5 Data collection

On the screening days the students filled out a questionnaire (Appendix 3) for each patient, including information about age, gender, length of stay, weight, height, BMI, nutritional risk and the nutritional care practices used when identifying and treating nutritional risk. The NRS2002 was employed to screen the patients for nutritional risk.

4.4.5.1 Anthropometric measurements

Weight was measured without shoes and outer clothes in either a standing or sitting position to the nearest 0.1 kg with the apparatus available on the different wards, following usual hospital practice. Height was measured to the nearest 1 cm with a non-elastic measuring tape either in a standing position against a wall without shoes or alternatively with the half arm-span method if the patients had problems standing (124), a reliable substitute for standing height for the elderly (124, 125). BMI was calculated as weight (kg) divided by the square of height (m). The age-independent cut-off values defined by the WHO (126) were used when categorizing patients' BMI.

4.4.5.2 Assessment of nutritional risk

The translated Norwegian version from 2009 (127) of the NRS2002 form (79) was used to identify patients nutritionally at risk (Appendices 3, 4). The screening form is recommended by ESPEN (62) and the Norwegian Directorate of Health (57) for use in the hospital setting. The NRS2002 aims to detect patients who will benefit from nutritional treatment due to undernutrition and/or increased nutritional needs resulting from disease (79). In this way, both the presence of undernutrition and the risk of undernutrition are captured. The predictive validity of the NRS2002 has been documented by a retrospective analysis of 128 randomized controlled trials (RCTs), where patients at risk had a higher likelihood of a positive clinical outcome from nutritional treatment than patients not at risk (79). Moreover, in a separate RCT with 212 hospitalized patients, nutritional intervention resulted in a shorter hospital stay among nutritionally at risk patients with complications (128). Old age is also included as a risk factor, based on RCTs in elderly patients (79).

The screening form included an initial screening and a final screening (Appendices 3, 4). The final screening was conducted if the answer was 'yes' to any one of the four questions in the initial screening. Patients with a total score of three or more in the final screening were classified as nutritionally at risk. All scorings of nutritional risk were checked by a clinical dietitian (me) shortly after each screening day.

4.4.5.3 Nutritional care practices

Questions regarding the nutritional care practices were developed in collaboration with representatives from the university hospital, the chef, a clinical dietitian and a research and development nurse, to ensure correct and relevant formulations. All questions were based on the recommendations stipulated in the Norwegian national professional guidelines (57) and the hospital's food service practice at the time (Appendix 3). The questions concerned the use of nutritional risk screening tools, whether weight measurements were taken on

admission and then on a weekly basis, the coding of undernutrition diagnoses (E43, E44, or E46) in line with the International Statistical Classification of Diseases and Related Health Problems 10th revision (ICD-10) (129), and initiation and type of nutritional treatment measures. This information was retrieved from the patients' medical records. The availability of weighing apparatus on each wards each screening day was noted by the students (Appendix 2).

4.4.6 Procedure of data collection

The students were instructed to participate on the screening days as part of their obligatory clinical training and education, which enabled a large collection of data. All the students were informed about the study and introduced to the screening form by a clinical dietitian (me) at the start of each academic year. Shortly before each screening day, clinical supervisors (lecturers and professors) from the university college met the students in small groups to go through the questionnaire and the screening form carefully. On each participating ward, the students received an envelope containing all the necessary material to conduct the screening. When the screening was finished, the questionnaires and the screening forms were carefully marked with proper ward-numbers and dates and placed back in the envelope, which was later collected. This way, it was easy to keep track of the questionnaires and the screening forms. A specially prepared manual instructed the students on how to fill in the questionnaire step-by-step and to use the screening form properly (Appendix 5). The students usually collected the data in pairs, making it possible for them to verify each other's work. Two persons (including me) central to the research project were available for the students at the hospital on all screening days. At the beginning of each screening day, these persons visited each participating ward to ensure that the students had started the screening, and to answer students' questions about the selection process, filling out the questionnaire or the use of the screening form. The students were also free to email or call whenever they wanted. A research and development nurse at the university hospital was employed by the research project to ensure better communication with the wards and to inform the ward staff about the screening.

4.4.7 Sample size calculations

Power calculations based on rather strong assumptions were performed a priori to assure an accurate estimate of the prevalence. After a literature review and discussions with experts in the field, the proportion of older people nutritionally at risk was assumed to be 30%.

According to the standard statistical power calculations, a total of 165 patients were needed to detect this large proportion with a 95% confidence interval (CI) of length 10% or less. To account for a possible clustering effect, an intra-class correlation coefficient (ICC) of 0.3 was assumed. The minimum number of patients required in the study to detect a prevalence of 30% nutritionally at risk with a 95% degree of confidence with a true population estimate between 25% and 35% was then estimated to be 522. Individuals within clusters tend to be more similar compared to individuals in different clusters, affecting standard errors of the estimates. Ignoring the cluster effect in this study would therefore have resulted in loss of the precision in the estimates. The ICC value was chosen based on the pilot study.

In line with the stratified sampling technique, a number of patients proportional to the size of each of the 20 participating wards (strata) were included (Figure 2). The size of a ward was defined as the daily average number of elderly patients, based on the records from the first six months of 2011 provided by the hospital's analysis department. Sampling on each ward stopped when the intended number of participants was reached.

4.4.8 Pilot and inter-rater agreement studies

A pilot study involving 290 elderly patients and 96 nursing students at the university hospital was conducted during the fall of 2010 and the spring of 2011. The purpose of the pilot study was to test the questionnaire used, as well as the use of a screening form. In addition, the pilot study confirmed that the bachelor nursing education program had an infrastructure that enabled the collection of data. The questionnaire was revised after the pilot study. Data from the pilot study is not included in the main study. The pilot study was performed before my employment, and I was only involved in revising the questionnaire used in the main study.

As a large number of students were involved in data collection for this study, the data quality might be questioned. A separate inter-rater agreement study on age, weight and height was therefore carried out (130). Two nursing students (S1 and S2) familiar with the main study, but not a part of it, were trained to collect data for the agreement study. On the third and fourth screening days, shortly after the ordinary screening was completed, S1 and S2 independently of each other re-screened 30 patients on seven wards. Data collected from S1 and S2 were later merged with the results of the main study for further analysis.

4.4.9 Data analysis

Patient characteristics and nutritional care practices were described as means and standard deviations (SD) or as frequencies and percentages, as appropriate. Differences between groups of patients were compared by a t-test for independent samples for continuous variables and Fisher's exact test or χ^2 -test for categorical variables.

The prevalence of nutritional risk was estimated as suggested by Cochran (123) in the following way: a proportion of patients nutritionally at risk in each stratum (ward), p_h , was estimated first; here $h = 1, 2, \dots, 20$ is the ward indicator. Then weights W_h were defined as the ratio of a ward size N_h to the total, defined as sum of all N_h , i.e. $W_h = \frac{N_h}{N}$, where $N = \sum_h N_h$. Then the weighted prevalence was calculated as $p = \sum_h W_h p_h$. The variance of estimated prevalence was then defined as $var(p) = \frac{1}{N^2} \sum_h \frac{N_h^2 (N_h - n_h)}{N_h - 1} \frac{p_h (1 - p_h)}{n_h - 1}$, where n_h is the number of patients sampled in ward h .

Agreement in patient age, weight and height as measured by the students was assessed by Bland-Altman analysis, where 95% limits of agreement were constructed. The 95% limits of agreement define an interval in which 95% of differences between two scorings would lie. The acceptable limits were set a priori to ± 1 year in age, ± 2 kg in weight and ± 3 cm in height. Bias, defined as the mean difference between measurements of two students, was assessed by one-sample t-test.

The statistical program IBM SPSS Statistics versions 20 and 22.0 for Windows were used for statistical analysis. P-values below 0.05 were considered statistically significant. All tests were two-sided. The analyses were conducted on anonymous data files. A statistician (second co-supervisor) conducted the analyses in paper I, while the analyses in paper II were performed by me in cooperation with the second co-supervisor.

4.5 Qualitative part (papers III, IV)

4.5.1 Study design

Two focus group sub-studies were conducted. Sub-study I was performed with nurses from the university hospital working in wards also included in the cross-sectional study. Sub-study II consisted of nurses and undergraduate nurses working in five nursing homes accepting patients from, and transferring patients to, the hospital. The perspectives chosen were based on the healthcare professionals' usual involvement in nutritional care at the research sites. In nursing homes, undergraduate nurses often play a much more central role

in the treatment and care of the patients, including responsibility in nutritional care, and were therefore chosen to be participants together with the nurses in sub-study II.

The sub-studies were based on a hermeneutic phenomenological methodological approach, since they aimed to explore and interpret the lived meaning of the participants' own experiences and perspectives related to providing adequate nutritional care for elderly hospitalized patients (118). This methodology is inspired by both phenomenology and hermeneutics, where the philosophers Husserl and Gadamer, respectively, account for much of the philosophical foundations (131). In line with the hermeneutic phenomenological methodological approach, we wanted to describe the world as experienced by the participants by going beyond pure description and attempting to discover meaning that is not immediately apparent (118). According to Gadamer, knowledge and understanding are generated in a dialectic process between the whole and its constituent parts, whereby the researcher's preconceptions form one integral component (132). Neither the whole nor its constituent parts can be understood without reference to each other (118). We strived to keep this balance and viewed our preconceptions (outlined in section 4.1) as an essential part of generating understanding and knowledge.

Focus group interviews are particularly useful when the aim is to learn more about people's experiences, attitudes and views in an environment where many people interact (133, 134), like in the hospital setting. Group interactions are considered to be an important part of the research method, and our participants were encouraged to comment and discuss each other's experiences and points of view (133-137). By asking each other questions, exchanging anecdotes and commenting on each other's experiences and points of view, the participants may get new insight and understanding of the themes under discussion, and this collective interaction may bring forth more spontaneous, expressive and emotional views than in individual interviews (118, 133). The aim was not to reach consensus about the issues discussed but to elicit a variety of experiences, attitudes and views (118, 136).

Through interpretations of our participants' described experiences and views collected in sub-study I, we investigated what constitutes barriers to ensuring adequate nutritional care for the undernourished elderly at the university hospital (paper III). The aspects involving participants' experiences and perceptions regarding hospital documentation and the flow of nutritional information for elderly patients transferred between the hospital and the associated nursing homes collected in both sub-study I and II were investigated (paper IV). In this sense, we found a focus group design based on a hermeneutic phenomenological methodological approach to be a suitable research method.

4.5.2 Sampling of participants

Participants were selected based on the extent to which they would contribute to the study aims, in a purposive sampling procedure (134, 136, 137). The goal was to get a broad perspective and encourage discussion, leading to richness and variety in the collected data (136). In sub-study I, the 16 participants were therefore recruited from seven somatic wards at the hospital, all with a high share of elderly (≥ 70 yrs) patients (Table 4). Participation required that the nurses had worked bedside for the last three months in a 50% position or more on the same ward. The section nurse selected the participants. The 27 participants in sub-study II were recruited from short- and long-term somatic units in the nursing homes (Table 4). One participant worked in a special care unit. Also here participation required that the nurses and the undergraduate nurses had worked in a 50% position or more in the last three months in the same unit in the nursing home. One participant worked in a less than a 50% position, but had worked in the same unit for more than four years. The nursing home manager, the section nurse or a research and development nurse selected the participants.

Table 4. Characteristics of the participants in the focus group sub-studies

Nurses, sub-study I, hospital (N=16)		Nurses and undergraduate nurses, sub-study II, nursing home (N=27)	
Gender, N		Gender, N	
Female	15	Female	25
Male	1	Male	2
Age, years		Age, years	
Mean	29.3	Mean	44.6
Range	23–47	Range	23–64
Type of ward, N		Health profession, N	
Orthopaedic	3	Nurse	11
Upper gastro surgery	2	Undergraduate nurse	16
Lung	4		
Cardiology	3		
Haematology/infection	1		
Neurology/endocrinology	2		
Neurology/stroke	1		
Experience as nurse, years		Type of unit, N	
Mean	5.7	Long-term	14
Range	1–21	Short-term	8
		Long-term + short-term	4
		Special care (dementia)	1
Experience with elderly patients, N		Professional work experience, years	
Some	5	Mean	17.5
Much	11	Range	0.25–40

4.5.3 Data collection

The data collection took place from May to November 2012. The focus groups were arranged in quiet rooms at the research sites. We tried to promote an open atmosphere by creating a warm and friendly environment (136), thereby allowing unanticipated statements and personal experiences to emerge. The participants were offered light refreshments. Each session lasted between one and a half and two hours.

The 16 participants in sub-study I were divided into four groups, each with a mix of participants from different wards. The first three groups had between four and six participants, while the last group comprised only two participants. We found that our data were sufficiently saturated (134, 137) after the three first groups, but we nonetheless decided to conduct the last group interview to see whether the low number of participants would allow the discussion to deepen and thus encourage new knowledge to appear, a technique recommended by Malterud (137). Five focus group interviews were conducted in sub-study II, one at each nursing home. Three groups had five participants, and two groups had six participants. The groups were mixed of participants with different healthcare professions from both short- and long-term units in the nursing homes. At least one nurse was required in each group. In our experience, data saturation (134, 137) was reached after five groups, and more group interviews were therefore not completed.

A moderator (me) and an assistant (first co-supervisor) were present at each session. The moderator introduced the themes for discussion and facilitated the interchange, while the assistant wrote field notes (Figure 3) and looked after the digital recorder (136, 137). The discussion was structured by an interview guide (Appendices 10, 11), to keep the discussion concentrated on the main aims (134). To ensure that all of the participants had the opportunity to speak, the groups were small and homogenous, and the discussion was structured relatively high (134), which is in line with the hermeneutic phenomenological methodological approach (138). The open atmosphere also encouraged this. The discussions were audio-taped and transcribed verbatim (118) by the moderator shortly after each session (Figure 4). The transcripts were carefully checked for transcription error by the moderator listening to the tapes again in their entirety. The transcripts were approximately between 16 000 to 25 000 words each.

Figure 3. Examples on field notes in paper III

More concerned with nutrition when the issue is more complex. Abrogation of responsibility/Documentation failure Lack of weights can be a challenge Nutrition can be a resource problem/priority problem

Figure 4. Examples on transcripts in paper III

Participant 13: Often they know how much they weighed once for a period or perhaps a few years back or something like that, if you ask. But we do not ask for weight today either (Moderator: No). So. And those who get that, who, you might have a clinical dietitian or initiate nutritional treatment measures on those having long stays, like with infections or (Moderator: Mm) who need extra nutrition (Moderator: Mm) to prevent. Mm. Participant 11: We do measure weight quite a lot (Participant 12: Yes), but it is not related to nutrition, it is more in relation to heart failure (Participant 12: Yes) and edema and dehydration and stuff like that. Participant 12: We probably do identify some undernutrition. Participant 11: Yes, probably we do that, but nutrition is not in a way the main focus (Participant 12: The main focus, no) for obtaining weights. It is not.
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4.5.4 The interview guides

Two interview guides were developed and used during the focus group interviews, each of them specifically adapted for use in the hospital and the nursing home setting (Appendices 10, 11). The questions on the guides concerned the four key recommendations in the Norwegian national professional guidelines (57). Data related to the identification, treatment and documentation of undernutrition in the nursing homes are not presented in this thesis. The interview guides were developed in collaboration with key persons experienced in research, the hospital setting, the nursing home setting and in the transfer of patients. In line with the hermeneutic phenomenological methodological approach, the participants were asked to think about their own experiences and specific situations from their daily work when discussing the questions. The participants were also encouraged to elaborate their statements by the moderator using pauses and probes such as, 'would you give an example' or 'would you explain further' (136). In order to obtain a variety of experiences, thoughts and perspectives, the questions were open-ended, and probes such as, 'have any of you experienced this differently' were used (136, 137). The participants were also informed that there were no right or wrong answers, but rather differing points of view, and they were encouraged to respond to each other, preferably without interrupting (136). To activate quiet participants, the moderator asked them questions directly. At the end of each session, the assistant offered a brief summary of the discussion, which the participants were invited to comment on.

4.5.5 Pilot study

A pilot study consisting of two focus groups with five participants in each was carried out in March and August 2012. The first group interview was performed with nurses from a rehabilitation ward at the university hospital, while the second group consisted of nurses and undergraduate nurses from short-term, long-term and special care units in a nursing home associated with the hospital. The main purpose of the pilot study was to test the two interview guides. In addition, the moderator and the assistant gained valuable skills and experience in arranging focus group interviews. In the first group, we experienced that the participants tended to say what they ought to do in nutritional care rather than what they actually did do. We therefore modified the interview guides in order to ask more directly for the participants' practical work experiences and opinions. By including probes such as, 'think back', in the discussion questions, the participants were encouraged to reflect upon their past experiences (136). In the second group, we experienced that the participants relatively quickly began to talk about mealtime and mealtime routines throughout the discussion, regardless of the questions asked. As a result, the groups in the main study were more structured to ensure that the participants touched upon all the discussion questions. Data from the pilot study is not included in the main sub-studies.

4.5.6 Coding and analysing of data

Analysis in qualitative research is a cyclical process as well as a reflexive activity (139), starting during the collection of data. The data generated in these sub-studies were analysed in the three interpretative contexts described by Kvale and Brinkmann (118): self-understanding, critical common-sense understanding, and theoretical understanding. These contexts did not represent consecutive steps; rather the researcher switched back and forth. Neither the individual nor the group statements alone were units for analysis, but instead we tried to seek a balance that recognized an interplay between these two levels (135, 140). The moderator and the assistant, respectively, performed the main analysis in paper III and IV. The analytic process was comprehensive and systematic, but not rigid (139).

In the self-understanding context, the researcher tries to capture what the subjects understand to be the meaning of their statements. To capture these perceptions, we coded the data so that the texts' meanings could more clearly be seen. We chose an editing (data-based) analysis style where the text is reorganized and coded by way of codes developed from the data itself in an inductive process (141). Both the moderator and the assistant read through all the transcripts and field notes several times to get a sense of the whole before

they discussed and agreed upon some main themes. Based on these themes, the data were coded (Table 5, 6) using the qualitative software program Atlas.ti (ATLAS.ti version 6.2.15, [Computer software] (1999) Berlin, Scientific Software Development) (paper III) or manually using colours (paper IV).

In the critical common-sense understanding context, the researcher goes beyond what is actually expressed, and the meaning of what is said is interpreted by the researcher asking questions of the data. In this way, the coded data is transformed into meaningful data. All the coded data units related to a particular code were presented together in order to explore and interpret the meaning in each coded set. Main codes were retrieved, split into sub-codes, spliced and linked together (Table 5, 6), and summaries were made (139).

In the context of theoretical understanding, a theoretical framework relevant for the study is applied to understand and interpret the theoretical meaning of the data in order to generate theoretical themes (Table 5, 6). The researcher steps back, considers what the analysed data mean, and assesses their implications for the question at hand. The Norwegian national professional guidelines (57), the regulations in the Patients' Rights Act (8), the Health Personnel Act (73), the Coordination Reform (1, 2) and relevant literature on nutrition, the elderly and aging, constituted the theoretical framework. Summaries and theoretical themes were generated, which were later discussed with the moderator/assistant and the project leader. The original transcripts were also re-read to validate whether the theoretical themes still reflected the original contexts appropriately (142).

Table 5. List of main-codes, sub-codes and theoretical themes generated in paper III

Main-code:	Sub-code:	Theoretical theme:
Lonely nursing task	Diffuse clinical dietitians resources	Loneliness in nutritional care
	Dependent on the nurses	
	Lack of coordination	
Knowledge and skills	Identification	In need of competence in nutritional care
	Treatment	
Food services and system	The ordering system	Low flexibility in food service practices
	Food options	
Not systematized	Little facilitated	System failure in nutritional care
	Missing routines	
Given less priority	Length of stay	Neglect of nutritional care
	Stress/time	
	Disease focus	

Table 6. Illustrations of how the data in paper III were structured into main-codes, sub-codes and theoretical themes

The coded data:	Main code:	Sub-code:	Theoretical theme:
Participant 2: It's probably us that must take care of.... take care of it (Participant 5:... maybe remember it), mostly, at least (is interrupted). Participant 5:... I can gladly... I've experienced several times that the patients have been lying in bed for almost a week. And, maybe we should initiate cabiven (parenteral) treatment, because, well, the physicians have totally forgotten about it, and I feel that we actually must, think most about it in fact. (Participant 4: Mm) Remember it.	Lonely nursing task	Dependent on the nurses	Loneliness in nutritional care
Participant 6: And also it's that when you're thinking undernutrition, you're thinking about those skinny, skinny, skinny persons. You don't think so much about those who are big and totally malnourished, and who in that sense are undernourished	Knowledge and skills	Identification	In need of competence in nutritional care
Participant 4: Well, actually I experience that our physicians are mostly concerned about operating on the patients. When the patients have had the operation and the X ray is fine, and they're mobilized and done with treatment, and they're undernourished, then that isn't something we're supposed to treat. No	Given less priority	Disease focus	Neglect of nutritional care

4.1 Ethics

The cross-sectional study was completed in compliance with the guidelines of the Helsinki Declaration and approved by the university hospital's Internal Privacy Commission as well as by the hospital management. The patients had to give an oral informed consent prior to participation (Appendix 1). As the screening data were anonymous, the study was exempted from review by the Regional Committees for Medical and Health Research Ethics (Ref.nr 2011/2088 A). The researchers received anonymously completed questionnaires and screening forms from the students and never met the patients. The students had signed a non-disclosure declaration beforehand as part of their practicum. The students also received an information sheet (Appendix 6) regarding what to do if patients were nutritionally at risk. The sheet was based on recommendations stipulated in the Norwegian national professional guidelines (57). The university hospital and the university college have signed cooperation agreements that include research as well as regulating and securing the students' clinical practice studies.

The focus group sub-studies were approved by the university hospital's Internal Privacy Commission, and by the management of the university hospital and the nursing homes. The Head of Research at the hospital and the nursing home managers were contacted first, before the information was forwarded to the relevant persons at the hospital wards and the nursing home units. All participants gave their written, voluntary and informed consent prior to participation (Appendices 8, 9). The sub-studies were exempted from review by the Regional Committees for Medical and Health Research Ethics (Ref.nr 2012/219 A), as the research was not considered as 'research on humans, human biological material or health information' (cf. §2 of the Health Research Act). The tape recordings and the field notes were stored in a fireproof safe. A key-code connected the participants with the tape recordings, the field notes and the anonymous transcripts. The transcription was done on a laptop with no connection to the internet, and the audio files were deleted from the laptop afterwards.

5 Summary of the results

5.1 The quantitative part (papers I, II)

The results presented in papers I and II are stemming from the cross-sectional study. Information on patient characteristics and participation status are presented in the paragraph below, while summaries of the papers' separate results are presented thereafter.

The study population consisted of 508 patients (48.8% women and 51.2% men) with a mean age of 79.6 years (SD=6.4). Mean BMI was 24.9 kg/m² (SD=4.9), and the patients had, on average, been hospitalized for 5.3 days (SD=6.3). In total 201 patients (44.4%) were nutritionally at risk, as classified by the NRS2002. Using the WHO's BMI cut-off values, 6.5% were identified as underweight, 48.0% of normal weight and 45.5% as overweight. Of the patients nutritionally at risk, 16.0% were identified as underweight, 57.8% of normal weight and 26.1% as overweight. Due to some students' incomplete reporting on seven wards, only approximate information on participation status was known. Of 1 059 patients with known participation status, 145 patients (13.7%) declined participation, while 390 (36.8%) were excluded according to the predefined criteria.

Paper I: Prevalence of nutritional risk in the non-demented hospitalised elderly: a cross-sectional study from Norway using stratified sampling

This paper aims at estimating the prevalence of nutritional risk for elderly hospitalized patients by using stratified sampling along with adequate power calculations. The paper also contains the results from an inter-rater agreement study on age, weight and height.

The prevalence of nutritional risk was calculated based on the recordings from 453 patients (89.2% of the total sample) for whom nutritional risk was available. The prevalence of nutritional risk was estimated to be 45.4% with 95% CI (41.7%; 49.0%), ranging between 16.7% and 65.0% on different wards. Patients nutritionally at risk had been staying at the hospital longer and had lower average weight and BMI compared to those not at risk (all $p < 0.001$). There were no differences in mean age or gender between patients nutritionally at risk and those not at risk.

Results from the inter-rater agreement study did not show considerable differences in mean age, weight or height, and consequently, there was no significant bias between pairs of students. Differences between S1 and S2 were marginal. Deviations between the nursing students performing ordinary screening and S1 and S2 were somewhat larger. These

deviations, however, were caused by only a few values, as identified by assessing the Bland-Altman plots (Appendix 7).

In conclusion, this paper shows that the prevalence of nutritional risk among elderly patients without dementia is high, suggesting that a large proportion of the hospitalized elderly are in need of nutritional treatment to prevent and treat undernutrition.

Paper II: Are nutritional care practices adequate for elderly hospitalized patients? A cross-sectional study

In this paper, the university hospital's nutritional care practices used in identifying and treating nutritional risk in elderly patients are assessed.

The results showed that, in the ordinary hospital setting, a screening tool had been used on only six (1.2%) of 478 patients with non-missing values, and weight on admission was recorded for 46 (9.5%) of 483 patients with non-missing values. Among the 129 patients staying longer than seven days, weight within the last week was recorded for only 18 (14.0%). Of the 178 patients nutritionally at risk with non-missing values, only 56 (31.5%) had received some form of nutritional treatment, with adaptations to the eating situation or the normal diet and supplement drinks being the most common treatment measures. Adjusted diet, energy- and nutrient-enriched meals, snacks between meals, enteral and parenteral nutrition were seldom used. Only seven (3.5%) of 199 patients nutritionally at risk with non-missing values were diagnosed with undernutrition (E43, E44, E46), and as few as eight (14.3%) of 178 patients nutritionally at risk with non-missing values had been referred to a clinical dietitian. Notably, patients with BMI ≤ 18.49 kg/m² were weighed more frequently ($p=0.028$) on admission compared to patients with BMI ≥ 18.5 kg/m². Of the patients nutritionally at risk, those with BMI ≤ 18.49 kg/m² received some form of nutritional treatment more often compared to ($p<0.001$) patients with BMI ≥ 18.5 kg/m². Moreover, weight was recorded more frequently ($p=0.013$) on admission on surgical wards compared to medical wards.

In conclusion, this paper demonstrates that nationally and internationally recommended nutritional care practices were not implemented at the hospital, suggesting that the majority of the elderly patients nutritionally at risk are neither identified nor treated according to their needs.

5.2 The qualitative part (papers III, IV)

The data presented in papers III and IV were generated by the two focus group sub-studies. Summaries on the separate papers' results are presented below.

Paper III: Barriers to nutritional care for undernourished hospitalised older people

This paper aims to identify what nurses experience as barriers to ensuring adequate nutritional care for the undernourished hospitalized elderly. Four focus group interviews with nurses from the university hospital were conducted (sub-study I).

Five themes reflecting barriers that the nurses experienced in their daily work on hospital wards were identified. The first theme, *loneliness in nutritional care*, was based on the reported frustration concerning the physicians' low level of involvement and engagement in nutritional care, and the low availability of clinical dietitians. Also, the nurses considered themselves responsible for nutritional care, as no one else assumed this responsibility. In the second theme, *a need for competence in nutritional care*, a lack of sufficient knowledge and skills in identifying and treating undernourished elderly patients was reported. For example, terms like underweight and skinny were often used to describe undernourishment. The third theme, *low flexibility in food service practices*, was described by a lack of variation in the food served, few choices for snacks in between meals, a complex ordering system and tight time limits for ordering meals, giving the nurses few opportunities to individualize meals and meal times for the patients. In the fourth theme, *system failure in nutritional care*, the nurses reported a lack of a system to ensure nutritional care for the undernourished elderly. Systematic screening of nutritional risk on admission was clearly not integrated into daily routines, and in general, nutritional treatment was initiated only occasionally. In the fifth theme, *neglect of nutritional care*, the nurses experienced that nutritional care was given little attention in the hospital setting. Hectic working days, focus on acute disease treatment and short hospital stays resulted in a neglect of nutritional care.

In conclusion, this paper implies that nutritional care at this hospital has its limits both within the hospital structure and organization and when it comes to the nurses' competence. Moreover, the barriers revealed that the undernourished elderly are not identified and treated properly, as stipulated in the Norwegian national professional guidelines.

Paper IV: Documentation and communication of nutritional care for elderly hospitalized patients: perspectives of nurses and undergraduate nurses in hospitals and nursing homes

This paper describes how information on nutritional status and treatment is documented in hospitals and how nutritional information is communicated between hospitals and nursing homes, for elderly patients. Four focus group interviews with nurses from the university hospital (sub-study I) and five focus group interviews with nurses and undergraduate nurses from nursing homes associated with the hospital (sub-study II) were performed.

The results were organized in three main themes each elaborated by two or three sub-themes (not shown here). In the first theme, *inadequate documentation of nutritional status on hospital admission*, the nurses reported that the elderly patients were never screened for nutritional risk on hospital admission. Some nutritional information was, however, documented on hospital admission, such as data on weight, likes, dislikes, and diet, but the quality of the information was inconsistent and mostly poor. In the second theme, *inadequate and unsystematic documentation of nutritional information during hospital stay*, the nurses reported that documentation of nutritional information often was related to food intake, appetite, and physical abilities influencing eating, and that documentation of nutritional treatment hardly ever took place. The documented information was also often limited, giving little information of the actual food eaten and the nutritional value. Moreover, a lack of structure in the documentation was reported by the nurses, and the nutritional information was documented several different places in the medical record. Nurses also reported giving limited attention to nutritional documentation which was related to the short hospital stays and the hectic working days. In the third theme, *limited communication of nutritional information between hospital and nursing homes*, the nurses at the hospital reported that they rarely received nutritional information from the nursing homes, and if they did, the information was not adequate. Similarly, the nurses and the undergraduate nurses in the nursing homes reported that the nutritional information they received from the hospital was of poor quality and hardly gave any useful information on elderly patients' nutritional needs.

In conclusion, this paper suggests that the documentation of nutritional status and treatment varied considerably for elderly patients and was mostly not satisfying, either on hospital admission or during the hospital stay. Moreover, nutritional information was seldom properly communicated when elderly patients were transferred between the hospital and the associated nursing homes.

6 Discussion

6.1 Methodological considerations

6.1.1 The overall study design

This thesis comprises in total four papers, presenting quantitative (papers I and II) as well as qualitative (papers III and IV) data. The specific research aims guided the choice of methods, which corresponds to the mixed methods research design (112). By using a convergent parallel mixed methods approach, we were able to compare and integrate the main findings from a cross-sectional study with the perspectives of nurses and undergraduate nurses from two focus group sub-studies, allowing for a better understanding of the problem of undernutrition and the risk of undernutrition as well as the management of nutritional care in the hospitalized elderly patients. It can be argued that this mixing of data will provide a more complete understanding of the research problem than either method by itself and that a greater depth and breadth were created in the overall results (112, 115). Moreover, the results from the different papers do verify and strengthen each other by showing similar results (112). However, collecting and analysing both quantitative and qualitative data can be challenging, as the researchers must be familiar with both methods (115). Hence, the procedures for data collection and analysis need to be conducted rigorously for both methods, such as adequate sampling and sources of information (112). This is discussed below.

6.1.2 Quantitative part (papers I, II)

Major issues that arise when conducting cross-sectional studies will be discussed below. These issues include choosing the correct study design and sample, and selecting appropriate methods for measurement (120).

6.1.2.1 Study design and sample

The cross-sectional study was specifically targeted at estimating the prevalence of nutritional risk among elderly (≥ 70 yrs) hospitalized patients. The high representativeness of the study sample was ensured by employing a stratified sampling technique in the data collection. Stratified sampling is a preferred technique to use in hospitalized populations because of the differences in the patients' diagnoses on different wards (120, 123). Hence, by selecting a correct proportion of the elderly patients from each strata or sub-group, a sufficient representation of each participating hospital ward was ensured in the study sample

(123). The same level of representativeness would be difficult to achieve with simple random sampling as some wards could be over- or under-represented in the study sample (120). In addition, since the variances of the entire study sample are based on the variances within each strata or sub-group, stratified sampling tends to produce more precise estimates of population parameters as compared to simple random sampling (120). Due to possible similarities in patient characteristics within the same wards, the presence of a cluster effect within each ward was also assumed in the power calculations. As estimated by the ICC, the cluster effect in the data was only 5.4%, which is considerably lower than the 30% assumed in the power calculations. A much lower estimated ICC than the one assumed in the power calculation implies that a smaller sample size would be sufficient for producing a prevalence estimate. Therefore, though the sample size was slightly smaller than planned (508 of 522) we consider it to be sufficient for producing a reliable and accurate prevalence estimate.

The study sample comprised nearly all somatic medical and surgical wards at the university hospital, in addition to four associated wards. Unfortunately, for ethical and practical reasons it was not possible to include patients from the psychiatric division and patients diagnosed with dementia, as managing the logistics of getting consent from the patients' relatives would have required a great deal of resources. The results can therefore only be generalized to the non-demented elderly population in the university hospital's somatic wards. It has been argued that large hospitals tend to differ from other hospitals in terms of ward composition by providing more specialized care, which could affect the case mix of the studied population (77, 143). However, by providing more specialized care in addition to locally based specialist healthcare services, large hospitals usually handle a wider variety of potential diagnoses, and sampling from large hospitals will therefore ensure more representative data. Furthermore, as the hospital provides healthcare services to half a million people, a heterogenic population with respect to both socioeconomic factors and ethnicity, the hospital population is also comparable to the Norwegian society as a whole. Nevertheless, as the study sample was obtained from one hospital only, the results might not be representative for other hospitals. Also, as most (70%) of the data was collected after the Coordination Reform was implemented, our study sample may differ from samples in Norwegian studies conducted before 2012. Due to decreased hospital stays, hospitalized patients are more likely in worse health now than before the reform.

Non-participation is a particular problem that may affect the results in a cross-sectional study, particularly when the characteristics of the non-participants and the participants differ (120). In the cross-sectional study a consecutive inclusion of patients was

performed by including all eligible patients, and a somewhat low participation rate does not affect the data quality. Neither the students nor the ward nursing staff selected the participants in any particular way. Another strength is that the researchers were not involved in the data collection and never met the patients. However, on some wards a greater number of patients was excluded than on others, and there is a risk that attitudes among the ward nursing staff may have led to unnecessary exclusion of patients. This could influence the data quality if many of these patients were nutritionally at risk. Unfortunately, no detailed information on patient exclusion was collected, and future studies should note the importance of obtaining such information. Another limitation was that nutritional risk was unknown for 11% of the study sample due to missing data on weight (n=12), previous weight (n=11), or to the fact that the students had not filled out the screening form properly (n=32). No systematic incompleteness was observed, however. Moreover, similar and even higher numbers on missing data on nutritional risk have been reported in other studies (14, 16, 34, 100). There was also a non-negligible amount of missing data on nutritional treatment, as well as frequent use of 'Do not know' when reporting the usage of screening tools in the ordinary hospital setting on different wards. However, considering the inadequate nutritional care management found in this thesis, this may reflect the difficulties experienced by the students in finding this information in the patients' medical records.

6.1.2.2 Methods for measurement

It would have been preferable to measure weight with calibrated weighing apparatus, before breakfast and after bladder emptying, but since the data collection was part of the students' obligatory clinical training and education it was essential to follow usual hospital practice when screening the elderly patients for nutritional risk. Weight was therefore measured with non-calibrated apparatus at different times during the day, which may have affected the data accuracy. There was also a lack of chair and bed weights, as reported in paper II, and a portable stadiometer would have been the preferred method for measuring standing height instead of a non-elastic measuring tape. Height was alternatively measured (n=189) using the half arm-span method, which has shown to be a reliable substitute for standing height in the elderly (124, 125). However, half arm-span may reflect the maximum height of the individual more than the actual current height (124, 125, 144), which may have affected the accuracy of calculated heights, as aging often results in a reduced height. In papers I and II, the age-independent cut-off values presented by the WHO were used when categorizing the patients' BMI (126). However, as aging result in a loss of lean body mass and height, there is a debate in the relevant literature over which cut-off values of BMI to use in the elderly

(145). The choice of cut-off values affects the proportion of patients in the categories underweight, normal weight and overweight. Recent weight loss was calculated based on measured current weight and by asking the elderly patients what they normally weighed in recent months. Remembering previous weight can be a challenge, and therefore this method entails some uncertainty.

The MNA is the most widely used tool to screen elderly patients for nutritional risk in different healthcare settings. However, although the MNA is specifically developed and recommended for use in elderly patients (62, 82), it does not account for the effect of stress metabolism; therefore, the NRS2002 may be a more appropriate screening tool for use with the acutely ill elderly (31, 146-148). Moreover, since the data collection was part of the students' obligatory clinical training and education, it was relevant to choose a screening tool that is recommended by the Norwegian Directorate of Health frequently used in the hospital setting in Norway. Therefore, we employed the translated Norwegian version from 2009 of the NRS2002 form (127). However, after starting the data collection, we discovered that this translated version was not completely identical to the international version recommended by ESPEN (62). This may be of importance for the comparability of the results. It seems that the Norwegian Directorate of Health had based their translation on a preliminary version of the NRS2002 form (149), which has been used in other studies (14, 84, 149). The Norwegian Directorate of Health has since updated their translated version (57). Though the differences between the international edition and the translated Norwegian version from 2009 are small, the forms do not have the exact same cut-off values for recent weight loss in the initial screening and the final screening. However, there is currently no consensus regarding the best cut-off points for weight loss (13, 26), and we consider this to be of minor significance for this study. There are also certain differences for cut-offs for food intake. Further, in the international edition a score of one is added for patients aged ≥ 70 years, whereas in the translated Norwegian version from 2009 a score of one is added for patients aged >70 years. In our study only six (1.9%) of the elderly patients were exactly 70 years old.

The study demonstrates how a close multidisciplinary collaboration between a university hospital and a nursing bachelor's education program can facilitate the conducting of a larger research study by involving students in research activities. Using students in this cross-sectional study enabled a collection of a large data set using limited resources. By participating in a multidisciplinary research project of this scale, the students may also have improved their knowledge and awareness of undernutrition and use of recommended

nutritional risk screening tools as well as their understanding of research methods (150). The large number of students (n=173) participating in data collection might be seen as a shortcoming; however, the inter-rater agreement study showed that the data quality was acceptable. This may be related to a number of reasons. Firstly, before each screening day the students received supervision, and a specially prepared manual for filling out the questionnaire and using the screening form was handed out for each screening day. Secondly, as the students collected data in pairs, they may have verified each other's work, thus increasing data quality. Thirdly, the students collected data at wards where they were undergoing their acute and clinical care practice studies. Hence, they were familiar with the wards, the patients and the nursing staff, which could make it easier to perform the data collection. Fourthly, two persons central to the research project were available to the students on each nutritional screening day.

6.1.3 Qualitative part (papers III, IV)

Major issues related to conducting focus group studies are discussed below using the terms reliability, validity and generalizability. Since this thesis uses a mixed methods research design, it was relevant to choose terms familiar in both quantitative and qualitative research traditions, although the terms are used differently (117, 131).

6.1.3.1 Reliability of the sub-studies

In the words of Brinkmann and Kvale (131, page 281, italics in original): '*r]eliability* pertains to the consistency and trustworthiness of research findings; it is often treated in relation to issues of whether a finding is reproducible at other times and by other researchers'. The researchers' preconceptions have a major influence on the entire qualitative research process (117, 118) and are outlined in section 4.1 of this thesis. As the researcher serves as an instrument in both generating and analysing the data, it is possible that two researchers studying the same phenomena may share neither the same perspective nor the same interpretation. They should, however, be able to understand how the other researcher arrived at her interpretation. The focus group sub-studies were therefore reported by giving a detailed description of the whole research process, from data collection to analysis. The reliability of the focus group sub-studies was also strengthened by the fact that both the moderator and the assistant were involved in the analysis, individually and together, before the results were discussed with the project leader (117). During the focus group interviews, the moderator also encouraged the participants to elaborate their

statements to follow-up and clarify the meaning of the relevant aspects being discussed. In order to ensure appropriate and understandable questions for discussion, the interview guides were developed in collaboration with key persons and were tested and modified in a pilot study. The moderator transcribed the discussion, which may have been advantageous as it may have been easier for persons present during the sessions to more fully sense the nuances in the audio recordings (137). The transcripts were carefully checked for errors by listening to the tapes again in their entirety. We also attempted to connect the reader to the transcripts through well-chosen quotations of the participants' statements, thereby improving reliability (134). The fact that I am an educated clinical dietitian and informed each focus group about this fact may also have influenced the discussions. However, our experience was that the participants were uninhibited and honest when discussing nutritional care. For example, the participants in the hospital setting talked about both positive and negative aspects concerning the role of clinical dietitians. On the other hand, me being a clinical dietitian may have affected my in-discussion interpretations.

6.1.3.2 Validity of the sub-studies

Validity refers to whether a study investigates what is intended to be investigated (131). According to Brinkmann and Kvale this rests on the quality of the researcher's craftsmanship, and researchers are encouraged to continually check, question and theoretically interpret their findings throughout the entire research process (131). The validity of the findings in these sub-studies were strengthened by the fact that similar results were shown quantitatively in paper II, a concept often referred to as triangulation (117). A focus group design based on a hermeneutic phenomenological methodological approach was suitable, as we wanted to describe and interpret the lived meaning of the participants' own experiences and perspectives from their daily work (118). Using this approach enabled us to elicit a variety of experiences, attitudes and views about the issues discussed (133, 134), thereby gaining detailed insight into the context of providing adequate nutritional care for elderly hospitalized patients. However, a limitation may be that group norms affect what some of the participants say and how they say it, like conformity or anti-conformity (133, 134). Further, focus group studies are often criticized for not taking group interactions into account in the analysis (151). Even though group interactions are essential to produce focus group data, whether the group interactions themselves constitute data depends upon the aims of the research (135). As group interactions were not a part of the aim in these sub-studies, they were not included in the analysis. Moreover, it can be challenging to preserve

individual experiences in a group context, which is essential in qualitative research based on a hermeneutic phenomenological methodological approach (138). In the sub-studies, we arranged small groups and gave them a relatively high degree of structure to ensure that everyone had the opportunity to speak (138). We tried to create an open atmosphere, thereby allowing unanticipated statements and personal experiences to emerge. To validate the content of the focus group interviews, the assistant offered a brief summary of the immediate impressions from the discussions, on which the participants were invited to comment. After arranging three focus groups at the hospital and five focus groups in nursing homes, we experienced that the data was sufficiently saturated (134, 137), even though this could be experienced differently by other researchers. A limitation could be that the sample size is small, and all the participants from the hospital setting were recruited from the same hospital. While this ensured that the participants had a common frame of reference, a greater variety and richness in the collected data may have been achieved with participants from other hospital settings. Nevertheless, the hospital provides healthcare services for a large, heterogenic population. The participants from the nursing home setting were also recruited from five different nursing homes. The results identified reflect the nurses' and the undergraduate nurses' perspectives and experiences, and different results may have been found if we had arranged groups with other healthcare professionals. Nevertheless, nurses and undergraduate nurses often take responsibility for patients' nutritional care (110, 152). A limitation is that our research only exposes the participants' experiences and opinions without accessing medical records, discharge summaries or incoming summaries. However, the results from paper II confirm the lack of nutritional documentation found in paper IV.

6.1.3.3 Generalization of the findings

The goal of conducting research is to generate knowledge that can be shared and applied beyond the study setting (117). In qualitative research, the goal is to enhance the understanding of the phenomenon being studied (117, 131). Hence, the results from the focus group sub-studies cannot be generalized to a larger population beyond the study sample, but they may have transferability to similar contexts or situations (117). Analytical generalization, as described by Brinkmann and Kvale, involves a reasoned judgment about the extent to which the findings of one study can be used as a guide to what might occur in another situation, and is based on an analysis of the similarities and differences between the two situations (131). In order to facilitate the transferability of the findings in the focus group sub-studies, a clear description of the contextual background has therefore been

given, such as demographics of the participants and the study settings (117, 131). This enables the reader to evaluate for which situations the findings might provide valid information and thereby the transferability of the findings (131). For example, although the barriers illuminated in paper III are important to consider when improving routines and quality of nutritional care, each context must be considered individually.

6.2 Discussion of the results

The main results presented in the four papers will be discussed simultaneously in the sections below. The results are interpreted as a whole and discussed in the light of relevant research. The discussion ends with reflections for the road ahead.

6.2.1 Nutritional risk in elderly hospitalized patients

6.2.1.1 The extent of the problem of nutritional risk

As shown in paper I, the estimated prevalence of nutritional risk was as high as 45% for the total sample in the cross-sectional study. This suggests that nearly half of the elderly patients without dementia were in need of appropriate nutritional treatment to prevent and treat their undernutrition condition. To our knowledge, this is the first prevalence study on this scale conducted exclusively among elderly hospitalized patients in Norway. However, generalizations from cross-sectional studies are always challenging. Considering the previously discussed methodological issues regarding the study sample (section 6.1.2), the estimated prevalence estimate cannot be generalized to the entire elderly population at the university hospital. Nevertheless, by providing a prevalence estimate meeting strict methodological criteria, the results clearly show the extent of the problem of undernutrition and the risk of undernutrition among the hospitalized elderly in Norway today. The estimated prevalence would probably have been even higher if elderly patients diagnosed with dementia had been included (46), demonstrating the seriousness of the problem. The results can also be added to the body of accurate prevalence data in Europe, although the picture regarding the exact prevalence of undernutrition and the risk of undernutrition in elderly hospitalized patients is still incomplete. Our results underscore the importance of preventing and treating undernutrition in the elderly, and it is not unreasonable to assume that it will grow in importance, considering the ageing populations in Norway and Europe.

Our results are strengthened by the fact that similar figures have been reported in Norway and Europe. Just recently, comparable findings were shown in another Norwegian university hospital, also by employing the NRS2002 (5, 14). The proportion of affected

elderly patients was, however, slightly lower, which was somewhat surprising considering that elderly patients with dementia were included. However, unlike our study, the study was not specifically designed to estimate the prevalence of nutritional risk exclusively in the hospitalized elderly. Moreover, a nutrition strategy was implemented at the hospital in 2006, which may have had a positive effect on the estimate (84). Further, the data were collected before (2008–2009) the Coordination Reform was implemented. Hence, estimating the true prevalence of undernutrition and the risk of undernutrition in the hospitalized elderly is difficult, and variable prevalence estimates have been reported in most studies (4-7, 14-16, 22, 30-34). This is presumably due to methodological differences and weaknesses, and results are often not representative for the studied population and/or can seldom be generalized to a larger share of the elderly population at the hospital studied. Moreover, different measurement methods are often employed, such as screening tools and BMI cut-offs, making it difficult and even impossible to compare results across studies. Three European studies that also have employed the NRS2002 to identify nutritional risk have reported either lower (22–28%) (15), higher (54%) (31), or similar (42%) (16) rates compared to our results. However, none of the three studies used optimal statistical sampling methods for estimating prevalence rates (15, 16, 31), and only medical wards were included in the samples of the studies reporting either lower or higher rates (15, 31). Also, the published lower rate only reflects nutritional risk on hospital admission (15). Studies reporting much higher prevalence rates compared to our results have often used the MNA to identify nutritional risk (6, 7, 22, 31, 33, 34), which has been shown to identify more patients nutritionally at risk compared to the NRS2002 (31, 146, 153).

According to paper I, we observed no age difference between patients nutritionally at risk and patients not at risk. Age was in fact quite equally distributed in the two groups of patients. This was one of the more surprising findings since advanced age is a well-known risk factor of undernourishment (46), as shown in a number of other studies (5, 15, 16, 32, 33). Pirlich et al. revealed that higher age was an independent risk factor for undernutrition in multivariate analysis, and more than 44% of patients aged ≥ 70 years were undernourished compared to only 7.8% of patients aged < 30 years (32). On the other hand, this could be just an effect of the inclusion criteria (age ≥ 70 yrs), since younger patients were not included in our study sample, contrary to other studies that have found an effect of age (15, 16, 32). Moreover, we did not control for other patient characteristics, like length of hospital stay, multimorbidity or chronic diseases, and the effect of age might have been dominated by other factors. However, when Pirlich et al. performed the same multivariate analysis

separately in the sub-group of elderly (>65 yrs), age was still identified as an independent risk factor (32). Nonetheless, the picture might have been different if elderly patients with dementia had been included in our study sample.

6.2.1.2 Understanding the concept of undernutrition

The results presented in paper II revealed that more than 80% of the patients nutritionally at risk had normal weight (58%) or were overweight (26%), according to the WHO's cut-off values for BMI. Hence, the undernourished elderly patients, and those at risk of becoming so, can have normal weight or be overweight according to their BMI. This has also been shown in other studies on elderly patients (63) and on the general hospital population in Europe (5, 32, 100), and is consistent with the fact that an increasing number of people in Europe are becoming overweight or obese in the pre-illness period (29). However, undernutrition and the risk of undernutrition are easily overlooked in normal weight or overweight patients if nutritional risk screening is not routinely performed. Suominen et al. demonstrated that only the truly anorectic elderly patients with a mean weight of 45 kg and a mean BMI of 17.2 kg/m² were recognized as undernourished by the nurses (63). Of the patients having a BMI >24 kg/m², but identified as undernourished according to the MNA, only 2% were identified (63). Similar tendencies were found in paper II. Although patients generally were not weighed, those with a BMI ≤18.49 kg/m² were weighed more frequently on admission and received nutritional treatment more often when nutritionally at risk, compared to patients with BMI ≥18.5 kg/m².

Hence, normal or high BMIs seem to be confusing for healthcare professionals, as elderly patients in these categories do not present with obvious signs of undernutrition, such as being skinny (100). This implies that undernutrition is an unfamiliar concept for them, which also was revealed in paper III. Herein, the nurses often used terms like underweight and skinny to describe undernourishment. Khalaf et al. reported similar findings in their study where an undernourished patient generally was portrayed, as 'the thin one' in the narratives, like, for example, 'a very thin lady' (154). Moreover, in a study by Adam et al. the patient's current weight and BMI were common responses for the best indicators of nutritional status by the nurses and the physicians, and current weight was even considered a better indicator than involuntary weight loss (155). It is vital that healthcare professionals understand the criteria needed to identify and document undernutrition and the risk of undernutrition, so the right patients can be properly identified and treated. Although a patient's nutritional status may be adequate according to their current weight or BMI, other

factors may negatively affect nutritional status, such as involuntary weight loss (29). Hence, by evaluating only the current weight or BMI of elderly patients, healthcare professionals may overestimate the patients' nutritional status (63, 155), resulting in a major share of the affected patients being at risk of being overlooked. This is a rather worrying finding considering that undernutrition is easier to prevent than to treat and that the number of older people with high BMI is increasing. Therefore, nutritional risk screening should be conducted to help healthcare professionals accurately identify at risk patients.

6.2.2 Nutritional care for elderly hospitalized patients

6.2.2.1 Performance of recommended nutritional care

Collectively, the findings from papers II, III and IV all revealed that recommended nutritional care, in line with Norwegian and European guidelines, was not implemented into clinical practice for elderly patients at one large university hospital in Norway. The elderly patients were hardly ever screened for nutritional risk and undernutrition and the risk of undernutrition were clearly undertreated. Moreover, documentation of nutritional status and treatment was mostly lacking and nutritional information was seldom properly communicated between the hospital and the associated nursing homes. Hence, the nutritional care management was largely inadequate, suggesting that many of the elderly patients were not given adequate nutritional care in line with their needs. These are rather worrying findings considering that a large number of the elderly patients were in fact nutritionally at risk, as shown in papers I and II. Consequently, nutritional status may worsen during hospitalization and/or after hospital discharge, which might lead to poor patient outcomes, a greater need for healthcare services, and increased suffering for the patients. Every patient has a basic human right to have their nutritional needs met, and it is unacceptable that such basic needs are not fulfilled for elderly patients in Norway today. Also, the fact that recommended practices are not followed to ensure what is best for the patients is of moral concern.

To our knowledge, this is the first research project on this scale exploring nutritional care in the elderly hospitalized population in Norway; as such, it provides valuable knowledge on how undernutrition currently is prevented and treated in the hospital setting. However, nutritional care practices have been previously assessed to be inadequate in Norway (4, 10, 11, 101, 156), and already in 1991 Mowe et al. showed that undernutrition often was underdiagnosed and undertreated among elderly hospitalized patients (4). Compared to our results, these studies indicate that few improvements have been made (4,

10, 11, 101, 156). Our findings are also in accordance with other European studies on elderly hospitalized patients (6, 7, 63, 65) as well as general hospital populations (100, 101, 103, 105, 157), showing that undernutrition often is ignored in the hospital setting and that nutritional information seldom is communicated between healthcare settings to ensure nutritional follow-up. This is of major concern, considering that undernutrition can be prevented and reversed if adequate nutritional care is provided for the patients, often at low cost. Moreover, for the increasingly older population of Europe, including Norway, this represents a great threat to health and quality of life. It must however be recognized that there have been some successful initiatives in Europe in recent years, such as in Denmark and the Netherlands (104, 158, 159). In a study from Denmark, significant improvements in nutritional care were observed over a period of eight years, from 2004 to 2012 (104). The improvements were found to be related to the introduction of quality indicators in clinical nutrition (104). Moreover, in the Netherlands, hospital undernutrition tended to decrease in the period from 2004 to 2007, a trend which was positively influenced by participation in the annual Dutch National Prevalence Measurement of Care Problems and involvement in national improvement programs (158).

National professional guidelines are an instrument for ensuring quality and uniform practice throughout the country by providing recommendations for patient care based on evidence-based practice (160). In this thesis, we observed an insufficient implementation in practice compared to the Norwegian national professional guidelines on prevention and treatment of undernutrition. Hence, there seems to be a lack of application of these guidelines in clinical practice, despite the fact that several of the recommendations in the guidelines are mandated by law (57). In papers III and IV, the nurses at this large hospital also claimed to be unfamiliar with the guidelines, which is quite interesting considering that the target group for the guidelines precisely includes, among others, nurses working in hospitals (57). These first Norwegian professional guidelines for managing undernutrition in the healthcare sector represent an important step towards better nutritional care. However, to be effective the guidelines need to be implemented into clinical practice and become familiar among healthcare professionals, and the results suggest that much work remains to be done in this regard.

6.2.2.2 Routines and systems for nutritional care

Altogether, the results from papers II, III and IV demonstrated that there was a lack of routines and systems for nutritional care at the university hospital. These findings are in

accordance with other European studies, showing that the process of structured nutritional care often proves a challenge in many hospitals (84, 100-103). Holst et al. found a significant association between departments with a well-organized structure of nutritional care and a good nutritional practice (105). Moreover, in a study by Kondrup et al. two of the major areas causing the lack of focus on nutritional problems were 'lack of guidelines' and 'lack of instructions regarding nutritional risk screening and treatment' (77). The hospital management have an overall responsibility to create an optimal environment for the hospital staff so they can ensure adequate nutritional care for their patients, and routines and systems for nutritional care should be implemented into every department and ward (57, 62, 67, 69). However, according to the results in papers II, III and IV, this was clearly not accomplished at the hospital of interest. The nurses expressed frustration regarding the current structure and organization of nutrition, and sought change in nutritional care practices to improve routines and quality.

The nurses reported that routine screening for nutritional risk was not implemented in hospital routines, and the elderly patients' weight was seldom measured (papers III and IV). In fact, many of the nurses had not even heard about nutritional risk screening tools, which was a rather interesting finding considering that screening is mandated by law in Norway (57). Similar results were also shown in paper II, as the use of any nutritional risk screening tool was practically non-existent at the hospital, and patient weight was rarely recorded. There was also a lack of appropriate weighing apparatus, such as chair and bed weights, which made it challenging to weigh older people with diseases who often are bedbound and/or in severe pain. The identification of nutritional risk is an important first step in providing adequate nutritional care and is recommended nationally and internationally (57, 62, 67, 71); and a study from the Netherlands has shown that nutritional risk screening may reduce undernutrition in the hospitalized population, including the elderly (159). Considering the lack of awareness regarding what undernutrition actually is, nutritional risk screening could also identify patients who would otherwise be overlooked (61). However, nutritional risk screening does not necessarily result in better nutritional care unless appropriate nutritional treatment is initiated (61, 84, 161). Furthermore, the current evidence is insufficient to support the effectiveness of nutritional risk screening, although there is no evidence of no effect (162).

Hospital food services are an essential component of nutritional care and should be flexible and responsive to patients' nutritional needs (67). However, as shown in paper III, the nurses reported that low flexibility in the food service practices made it difficult for

them to individualize meals and meal times for the elderly patients, and the ordering system for meals was described as cumbersome and difficult. Also, the results in paper II demonstrated that adjusted diet, energy- and nutrient-enriched meals and snacks between meals were seldom used as treatment measures. Other studies have also shown that access to food outside meal times is often limited in hospitals, and that patients often have a very restricted choice of food (64, 163-167). Moreover, in a study by Chapman et al. the nurses actually felt disempowered in nutritional care by the catering arrangements at the hospital (161). According to paper III, the nurses also expressed some distrust of the food service staff and had experienced that they sometimes failed to serve the preferred meals ordered for the elderly patients. This has also been reported in other studies (164, 166), suggesting that close collaboration between clinical and food service staff is important. Moreover, our results imply that the provision of meals should be regarded more as an essential part of the patients' medical treatment, and not just as a 'hotel service' (69).

According to paper IV, the documentation of nutritional status and treatment for the elderly patients was incomplete on hospital admission and during the hospital stay, which also has been reported in other European studies on elderly patients (7, 65) as well as for the general hospital population (100, 104, 105, 156, 168, 169). This was also shown through the results in paper II, and could partly be explained by what the nurses described as unsystematic and unstructured documentation practices in papers III and IV. The nurses reported that the nutritional documentation in general was confusing and difficult to find, since it often was documented in several different places in the patients' medical records. Moreover, there seemed to be no standards regarding what ought to be documented, which also made it difficult for the nurses to trust what was written about nutrition. Because a patient's medical record is an important working tool for healthcare professionals, it becomes impossible to follow-up on elderly patients' nutritional needs when neither nutritional status nor treatment is properly documented (95). Appropriate documentation on healthcare services, including nutritional care, is also regulated by Norwegian legislation (73, 92, 93), which further strengthens the importance of improving nutritional documentation practices. The shift from paper-based to electronic documentation systems in the Norwegian healthcare services in recent years provides many opportunities in this regard (95), and it will be necessary to ensure that nutrition is integrated into the electronic patient record (94). In accordance with other studies (96, 97), our results also suggest that healthcare professionals are not utilizing the potential of the electronic patient record. For

example, in paper IV, the nurses reported that they sometimes triple-documented nutritional information to ensure that other healthcare professionals would notice it.

Nutrition-related diagnoses should be used when patients are undernourished. ICD-10 operates with three codes for undernutrition (while using the term malnutrition) in hospitals: E43, E44 and E46 (129). According to the Norwegian national professional guidelines, nutritional risk should be coded with E46, which refers to unspecified protein-calorie malnutrition (57). The E43 and E44 codes refer to unspecified severe protein-calorie malnutrition and protein-calorie malnutrition of moderate and mild degrees, respectively (57, 129). However, as described in paper IV, the nurses at the hospital said they were unfamiliar with these codes and had never seen them being used and/or documented. Paper II confirms this, as only 3.5% of the patients nutritionally at risk were diagnosed with undernutrition. These findings are in line with other studies (84, 170).

6.2.2.3 Competence and knowledge in nutritional care

In hospitals, limited nutritional competence and knowledge are likely to have an impact on the quality of the nutritional care provided for elderly patients, which also was shown in papers III and IV. The nurses stated that they generally found it difficult to identify undernutrition and estimate nutritional status, needs and intake. This was also shown through the nurses' descriptions of the undernourished elderly patients. Several of the nurses claimed to have more competence in initiating nutritional treatment, but they seemed to lack skills for individualizing treatment. Insufficient knowledge in identifying and treating undernutrition has been self-reported as the most common cause of inadequate nutritional practice in a survey among physicians and nurses working in Scandinavian hospitals (171), and was already in 2001 identified as a major barrier to proper food service and nutritional care in European hospitals (69). Moreover, this has been shown in a number of other studies (63, 77, 102, 105, 106, 164, 165), which supports the importance of increasing competence in and knowledge of nutritional care among healthcare professionals. A general need for increased nutritional knowledge in the healthcare sector in Norway has also been stated in a number of government documents since the 1970s (172), and there is a lack of proper education in nutrition in most healthcare education programmes (173).

According to paper III, the nurses expressed a lack of in-depth knowledge about risk factors for, and consequences of, undernutrition, implying a lack of awareness of its importance during acute disease. Comparable results have also been found in other studies (64, 163, 164). In a study by Bonetti et al., the nurses reported that undernutrition was often

considered of secondary importance compared to other aspects of treatment and care (64). One of the nurses illustrated this by comparing the transit of the food trolley with the transit of a train through a station (64, page 6): ‘when we are in a station and are announced that a train is going to transit, our only concern is to stay away from the track, without bothering too much about what the train is transporting or where it is going’. Moreover, Keller et al. found that developing a nutrition culture, by establishing recognition that nutrition is an important part of medical care, was seen as critical by nutrition personnel to achieve excellence in hospital nutritional care (163). Other Scandinavian studies have showed nutritional care generally to be considered important by healthcare professionals working in hospitals (101, 105, 106).

Limited nutritional competence and knowledge were shown through the nurses’ documentation practices in paper IV. The documented information was mostly related to food issues, such as appetite, likes, dislikes, diet, food intake and physical abilities influencing eating. Although these descriptions were relevant for nutritional care, the nutritional value of the documentation was not satisfactory, and many elements important for nutritional care were not documented. For example, the documentation regarding food intake gave little data on the actual food eaten, and unspecific statements such as ‘the patient ate a small portion’ were often used. Comparable findings have been shown in other studies (152, 167-169). Persenius et al. found that nurses mainly documented information on eating abilities or disabilities, while data on food amount, energy intake, BMI, weight and height rarely was documented (169). This indicates that healthcare professionals seem to be uncertain about what ought to be documented in relation to nutritional care. Similar uncertainty was insinuated through the limited nutritional information communicated between the hospital and the associated nursing homes. It is worth noticing that most of the nutritional information documented and communicated was related to meal provision, which suggests that nutrition is regarded more as a food service than an integral part of the patients’ medical treatment (69).

6.2.2.4 The acute-care hospital setting

Based on the results in papers II, III and IV, nutritional care for elderly patients seems to be given little attention in the acute-care hospital setting, despite the importance of preventing and treating undernutrition in the hospitalized elderly. As experienced by the nurses in papers III and IV, short hospital stays, focus on acute disease treatment and hectic working days resulted in a neglect of nutritional care, and the responsibility was therefore often transferred to municipal healthcare. Similar findings have also been reported in a number of

other studies (64, 77, 102, 154, 161, 163, 165, 174, 175). In a study by Kondrup et al. one of the main reasons for not classifying a screened patient as an at risk patient, at variance to the researchers' risk assessments, was the expected short duration of the hospital stay (77). Moreover, Ross et al. found that nurses felt powerless to prioritize nutrition in the acute-care hospital setting and that other medical problems were addressed first (165). This corresponds to the findings of papers III and IV, where the nurses explained that nutritional care was not a focus during hospitalization unless nutritional problems were thought to be an important factor for the patient's medical condition. Thus, there seems to be a tendency for healthcare professionals in the acute-care hospital setting to focus mostly on the patient's presenting medical condition and to give less attention to other potentially important factors associated with poor health, such as nutritional status (155). Additionally, as reported in paper III, the nurses expressed difficulty in raising the priority of nutritional care, compared to other nursing activities, due to high workloads and short hospital stays. Providing supplement drinks was described as a way of doing something during hectic working days, and was also found to be the most frequently used nutritional treatment measure in paper II. Some of the nurses reported that they even sometimes felt relieved when patients rejected meals, as they saved some time. Similar results have also been shown in various studies reporting that nurses often are busy with other tasks, such as documentation and medication, rather than giving assistance in eating (64, 154, 164, 167, 174).

Hence, nutrition seems to 'disappear' during hectic working days, acute disease treatment and short hospital stays, as it is seldom a first line issue. This might also be seen as a denial of the existence of undernutrition and the responsibility of nutritional care in a hospital setting, which could hinder nurses from discussing undernutrition or even finding out that patients are undernourished, as shown by Khalaf et al. (154). Although the nurses in papers III and IV acknowledged the existence of undernutrition by referring to underweight and skinny patients, adequate nutritional care was not provided. The average length of stay is currently decreasing in Norwegian hospitals due to the Coordination Reform (1, 2). A trend of decreasing lengths of stay is also the case in the rest of Europe (176). However, the high turnover in hospitals should not lead to the misconception that nutritional care is not important, and in a hospital setting it is unacceptable that undernutrition is not properly prevented and treated for elderly patients (62). Moreover, as undernutrition may play a major role in increased complications and morbidity, expected short stays might very easily become long stays and multiple stays if undernutrition is not adequately prevented and

treated, which is a paradox in the acute-care hospital setting. Patients with complex care needs, such as elderly patients, also often have longer stays than the average patient.

6.2.2.5 Multidisciplinary collaboration within and between healthcare settings
Despite the fact that nutrition is a multidisciplinary field, the nurses experienced that they mostly stood alone in ensuring nutritional care for the elderly patients, as shown in papers III and IV. This is consistent with a comparable study, wherein the nurses described a feeling of loneliness and abandonment due to the lack of support from other colleagues (154). Moreover, Chapman et al. found a general agreement among healthcare professionals that good nutritional practice involves a high degree of interaction between professional groups in a hospital, and that a lack of value placed on screening by the physicians undermines the nurses' sense of autonomy in nutritional care (161). Similar tendencies were revealed in papers III and IV, where the nurses reported frustration concerning the physicians' low involvement and engagement in nutritional care. In addition, the availability of clinical dietitians was described as too low, and the nurses were uncertain about which patients they should refer to dietetic resources. Therefore, the roles and responsibilities of nurses and other healthcare professionals in relation to nutritional care should be more formally defined. This has also been shown in other studies, and poor cooperation among the different hospital professions involved in nutritional care has been demonstrated to be a common barrier to good nutritional practice in hospitals (69, 102, 165, 174). Moreover, when no one is clearly accountable for the patients' nutrition, undernutrition is more likely to be left unidentified and undertreated (69, 77, 101, 165). Multidisciplinary collaboration among healthcare professionals in hospitals is also vital to meet the complex care needs of the elderly whom often have chronic and multiple disease pictures (1, 2, 8, 177).

For elderly patients, who often are in and out of hospital regularly, multidisciplinary collaboration between healthcare settings is important to prevent and treat undernutrition effectively. However, according to the nurses and the undergraduate nurses (paper IV), nutritional information was seldom properly communicated when elderly patients were transferred between the university hospital and the associated nursing homes. Very few studies have assessed this issue for elderly patients, but comparable findings have been reported for the general hospital population (100, 101, 105, 175, 178). This underscores a critical finding in paper IV: when nutritional information is not properly communicated, it becomes impossible to ensure adequate follow-up on the patients' nutritional needs. This may have serious clinical consequences for the elderly patients, which further could increase their needs for healthcare services. Prevention and treatment of undernutrition are often

time-consuming processes, and undernutrition cannot be effectively prevented and treated by a single organization operating independently. If not properly identified, treated and further communicated, undernutrition might very easily develop into a continuous negative ‘undernutrition’ carousel, where patients tend to move between healthcare settings with their underlying nutritional problem intact (57, 58). One of the main issues in the Coordination Reform is to improve the coordination of healthcare services and ensure continuity of care (1, 2). This is also regulated by Norwegian legislation (73, 92), however it seems to fail considerably with regard to nutritional care for the elderly patients. Recently published studies have identified a general lack in the communication of information between healthcare settings in Norway, showing that this does not apply to nutritional information only (179, 180). Nonetheless, national efforts are being made to improve the coordination between healthcare settings in Norway using electronic communication (99, 181, 182). Thus, better coordination is expected within a reasonable time, and it is important to ensure that nutrition is part of this development.

6.3 Reflections for the road ahead

In summary, the main findings of this thesis reveal that recommended nutritional care, as stipulated in the Norwegian national professional guidelines on prevention and treatment of undernutrition, was not implemented into clinical practice for elderly hospitalized patients, despite the fact that several of the recommendations are mandated by law. Considering the high prevalence of nutritional risk found in paper I and the potential serious consequences of undernutrition, this lack of implementation of recommended nutritional care raises an important ethical question: Are the current practices to prevent and treat undernutrition in the hospitalized elderly population in Norway acceptable for meeting the requirements for professional conduct for health personnel, as regulated by the Norwegian Personnel Act §4 (73, 74)? Our results suggest that they are not. The results presented in this thesis are however obtained from only one hospital, and it remains to be explored how nutritional care is carried out for elderly patients in other Norwegian hospitals. Moreover, in view of the serious nature of these findings, it may be reasonable to suspect that the situation is no better for the general hospitalized population, which also should be examined further.

With ageing populations in Europe, including Norway, it is important to ensure that the needs of elderly patients are adequately addressed by healthcare services. To prevent and treat undernutrition effectively, it is imperative that older people in hospitals receive adequate nutritional care and that nutritional information is properly communicated when

patients are transferred between healthcare settings. The findings of this thesis demonstrate a serious and unacceptable situation that may have severe consequences for elderly patients. This highlights the significant need for greater efforts to improve nutritional care, not only in the hospital setting, but also in the municipal healthcare sector. Based on our results, there is no doubt that efforts should focus on familiarizing healthcare professionals with the Norwegian national professional guidelines as well as implementing them in clinical practice. Healthcare professionals must assume their professional responsibilities when it comes to ensuring elderly patients' nutritional needs. Finding solutions for better nutrition in hospitals will be necessary, and the major issues raised in this thesis will be important to consider in such work, although each context must be considered individually. It is probably also relevant to ask whether these guidelines need to be updated and/or simplified in order for them to be of greater support in the clinical setting. For example, a revised guideline could recommend one nutritional risk screening tool, rather than leaving the professionals in the hospital to make the choice. This would also make it easier to compare national data as well as to assess and monitor progress in relation to prevalence rates and nutritional care management. We also believe that it will be of great value to have a common screening tool for all healthcare settings, as it may lead to a more seamless transfer of patients (61).

Based on the results discussed in this thesis, undernutrition is clearly a complex issue, and many changes must take place in order to ensure that this condition is appropriately prevented and treated among elderly hospitalized patients. Adequate nutritional care relies on both the general policies of the institution and on identifying the patients' individual needs, and must be grounded with the hospital management. Developing a nutrition culture where healthcare professionals work together and recognize the importance of providing adequate nutritional care in the acute-care hospital setting is clearly needed. Our findings suggest that healthcare professionals need more nutritional education and training, not only to improve their competence and knowledge in nutritional care, but also to increase their awareness and acknowledgment of the occurrence and importance of this problem during acute disease. This is already underlined in several government documents in Norway (1, 172, 173), and there is a need to strengthen nutrition education in all healthcare education programmes. Students must receive proper nutrition education to ensure that they have sufficient competence and knowledge to perform their professional responsibilities related to nutritional care. The many complex processes within the hospital setting that influence meal provision and nutritional care should also be carefully examined to ensure they are sufficiently responsive to the individual needs of elderly patients.

Healthcare professionals and food service staff should be held accountable for their activities related to nutritional care, and their nutritional responsibilities and roles should be clearly defined in internal clinical guidelines. In view of the great neglect of undernutrition found in this thesis, it is important that all healthcare professionals – and particularly the physicians, who have the overall responsibility for the patients – recognize that providing adequate nutritional care is an important part of patients' medical treatment in the acute-care hospital setting. It is also relevant to ask whether there are currently enough clinical dietitians in Norwegian hospitals to provide thorough dietetic support: in general, there is a low number of clinical dietitians working in Norwegian hospitals, and in some hospitals clinical dietitians are completely absent (172). Moreover, routines and systems that enable healthcare professionals to perform their nutritional responsibility properly must be put in place, for example nutritional risk screening should be implemented into hospital routines, the ordering system for meals should be simplified and appropriate documentation procedures should be put in place. Another issue of concern is the nutritional follow-up when elderly patients are transferred between healthcare settings. When nutritional information is not properly communicated, as shown in this thesis, it becomes impossible to ensure adequate follow-up of the elderly patients' nutritional needs and their nutritional status is more likely to deteriorate. It is also relevant to ask whether the municipal healthcare services are well enough equipped to provide adequate nutritional care for an increasing number of elderly patients. For instance, there is a documented need to strengthen nutritional expertise in the municipal healthcare sector (1, 172). Establishing criteria for adequate hospital nutrition at a national level, which has been found to be associated with improvements in nutritional care and a reduced prevalence of undernutrition in previous studies (104, 158), may also be important.

At last, it is interesting to discover that few changes seem to have taken place in actual clinical hospital practice, despite the increased focus on undernutrition in a political context in Norway over the last decade. However, it is worth mentioning that some changes have taken place recently regarding the focus on undernutrition. The Ministry of Health and Care Services, in the 2013 commission letters, instructed the regional health authorities to establish an overall nutrition strategy (183). In the Central Norway Regional Health Authority all health facilities have established a strategy, while the other health regions have only one health facility each that has a nutrition strategy. The Ministry of Health and Care Services expected all facilities to have established strategies by 2014 (184). A new center for Clinical Nutrition was opened at the University of Oslo in 2014, which includes the first

Norwegian National Advisory Unit for Disease-Related Malnutrition (185). One of the main duties of this unit is to assist hospitals to devise, establish and implement nutritional screening, nutrition strategies and action plans. Establishing nutritional quality indicators and registers is also in process (186).

7 Conclusions

In this thesis, we have explored nutritional risk and nutritional care among elderly patients at one Norwegian university hospital providing healthcare services for a heterogenic population, covering about 10% of the Norwegian population. Most importantly, the results demonstrate that key elements in nutritional care seem to be missing for elderly hospitalized patients, despite the fact that half of all elderly patients were in need of appropriate nutritional treatment to prevent and treat undernutrition.

As shown in paper I, the estimated prevalence of nutritional risk was as high as 45% among non-demented elderly patients, according to the NRS2002. Furthermore, the results from papers II, III and IV showed that recommended nutritional care, in line with Norwegian and European guidelines, was not implemented into clinical practice. The elderly patients were hardly ever screened for nutritional risk, undernutrition and the risk of undernutrition were clearly undertreated, documentation of nutritional status and treatment in the patients' medical records was mostly lacking and nutritional information was seldom properly communicated between the hospital and the associated nursing homes. This suggests that many of the elderly patients were not given adequate nutritional care in line with their needs, and that a basic need appears to be ignored or not sufficiently prioritized in the acute-care hospital setting today. This is unacceptable, is of imperative clinical and moral concern, and may have serious consequences for elderly patients.

The results from this thesis show that there is a clear need, and a high potential, for quality improvements in nutritional care to ensure undernutrition is effectively prevented and treated in elderly hospitalized patients. The major issues raised in this thesis will be important to consider in such work, although each context must be considered individually. Firstly, the results imply that increased competence in and knowledge of nutritional care must be promoted among all healthcare professionals. Secondly, routines and systems for nutritional care must be established making it possible to provide adequate nutritional care for patients. For example, nutritional risk screening must be implemented into hospital routines. Thirdly, nurses and other healthcare professionals' responsibilities and roles related to nutritional care should be more formally defined. Fourthly, a major issue of concern is the nutritional follow-up when elderly patients are transferred between healthcare settings, and that the nutritional information communicated must be improved to ensure continuity of care.

8 Suggestions for further research

Future studies should focus on how recommended nutritional care can be successfully implemented into clinical practice for elderly hospitalized patients in order to prevent and treat undernutrition effectively. Emphasis should be on all four of the key recommendations in the Norwegian national professional guidelines on prevention and treatment of undernutrition (57), in line with European recommendations. This will also be relevant for the general hospital population, and the findings presented in this thesis will be important to consider when designing such an implementation study, although each context needs to be considered individually. It will also be relevant to study other healthcare professionals' perspectives in relation to providing adequate nutritional care, as well as to study the perspectives of food service staff and elderly patients themselves in this regard.

A study designed to estimate the prevalence of nutritional risk among elderly hospitalized patients diagnosed with dementia would also be of significance, as this patient population is at particular risk of becoming undernourished. Furthermore, clinical studies should be carried out to assess whether providing systematic and adequate nutritional care is effective for improving outcomes for elderly patients in the hospital setting. In a Cochrane review from 2013, the authors concluded that more high quality studies should be conducted to assess the effectiveness of nutritional risk screening (162). There is also a need for adequately designed studies investigating the impact of individually targeted nutritional treatment measures on patient outcome, particularly with regard to the first steps of the nutritional ladder (13, 91). Also, given the large number of medical conditions in which nutritional treatment may be required, evidence bases are needed for specific patient categories (13), such as patients with dementia or rheumatoid arthritis.

Municipal healthcare services play a major role in preventing and treating undernutrition in older people, which is underscored by the declining length of hospital stay in Europe, including Norway (1, 2, 176). As a consequence of the Coordination Reform, the municipal healthcare sector must take care of an increasingly sick patient population, which means that more patients are undernourished or at risk of becoming so (1, 2). Moreover, the high prevalence of nutritional risk found in the hospitalized elderly, suggests both that many patients become nutritionally at risk in the community setting and remain so when discharged from hospital. In fact, providing adequate nutritional care in the community setting may contribute to a higher proportion of patients with better nutritional status at hospitalization, and hospital admissions may even be delayed or prevented. Further research

in the community setting will therefore be important. In particular, studies focusing on how undernutrition can be prevented and treated in nursing homes and homecare services are required, as these services are well placed to identify nutritional risk and prevent undernutrition. Few studies have explored this issue in the community setting in Norway. Research on the long-term effects of continuous nutritional care when patients are transferred between healthcare setting is also needed (13).

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11 Appendices

Appendix 1:	Information sheet to the patients, the cross-sectional study
Appendix 2:	Questions regarding participation status and the availability of weighing apparatus on each ward, the cross-sectional study
Appendix 3:	The questionnaire filled out for each patient, including the translated Norwegian version from 2009 of the NRS2002 form, the cross-sectional study
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Appendix 1

Muntlig informert samtykke vedrørende studie til forskningsprosjektet:

ERNÆRINGSSTATUS TIL ELDRE PASIENTER

(Nutritional status and care for elderly patients)

Jeg er sykepleiestudent ved [REDACTED]

Som en del av min praksisperiode skal jeg sammen med andre studenter i 2.studieår gjennomføre ernæringscreening av pasienter på 70 år eller mer innlagt i sykehus, og du blir derfor spurt om å være med på dette. Opplysningene vil bli brukt i et større forskningsprosjekt som har i hensikt å forbedre kvaliteten på ernæringsomsorgen som gis til eldre pasienter i dag.

Bakgrunn for studien: helsedirektoratet publiserte i 2009 nasjonale faglige retningslinjer for å identifisere, forebygge og behandle underernæring. Bakgrunnen er at mellom 10 og 60% av pasientene i institusjon kan ha en underernæringstilstand. Høyeste forekomst finner man blant eldre over 70 år. Sykdom er den viktigste årsaken, men både sykehus- og institusjonsopphold i seg selv gir også en økt risiko for underernæring.

Hva studien innebærer: ernæringscreeningen omfatter et skjema som jeg skal svare på sammen med deg. Jeg skal måle høyden og vekten din om dette er mulig, og innhente opplysninger om sykdom, matinntak siste uka, samt undersøke dokumentasjon av ernæringsstatus og behandling i journal. Din deltagelse i studien er frivillig. Du kan når som helst trekke deg uten å måtte begrunne en slik avgjørelse. Din beslutning vil ikke under noen omstendigheter påvirke din situasjon her på sykehuset og den videre behandlingen.

Hva skjer med informasjonen om deg: All informasjon om deg vil registreres på et skjema anonymt, slik at din anonymitet vil bli ivaretatt. Opplysninger som navn, personnummer og fødselsdato vil ikke innhentes. Informasjonen vil bli brukt i et større forskningsprosjekt som skal kartlegge forekomsten av underernæring blant eldre innlagt i sykehus, finne risiko faktorer for underernæring og undersøke hvor godt ernæringsomsorgen ivaretas for eldre innlagt i sykehus i dag.

Med vennlig hilsen

Sykepleiestudent kull H11

Kontaktpersoner: Stipendiat Helene Dahl Eide: [REDACTED]

Førstelektor [REDACTED]

Appendix 2

Ernæringscreening 2013

Avdeling og avdelingskode:

Avdelingsspesifikke data:

1. Totalt antall pasienter på 70 år eller mer (født før 1943) som var innlagt på avdelingen kl. 08:
2. Antall pasienter på avdelingen som selv svarte nei til å delta:
3. Antall pasienter på avdelingen som selv svarte ja til å delta:
4. Antall pasienter på avd. hvor studenten svarte nei på vegne av pasienten:
 - a. Oppgi eventuelle årsaker til dette:
5. Er det ståvekt tilgjengelig på avdelingen?
☐ Ja ☐ Nei ☐ I stand ☐ Vet ikke
6. Er det stolvekt tilgjengelig på avdelingen?
☐ Ja ☐ Nei ☐ I stand ☐ Vet ikke
7. Er det sengevekt tilgjengelig på avdelingen?
☐ Ja ☐ Nei ☐ I stand ☐ Vet ikke
8. Er høydemåler tilgjengelig på avdelingen?
☐ Ja ☐ Nei ☐ I stand ☐ Vet ikke

Dette skal gjøres:

- Alle pasienter som er 70 år eller eldre som ligger inne på avdelingen kl. 08.00 skal screenes i løpet av dagen. Det er lurt å screene pasienter som snart skal dra hjem først.
- Det kreves muntlig samtykke for at pasienten kan delta i studien. Pasienter som er diagnostisert med demens eller som er terminale skal ikke være med i studien. Konferer først med kontaktsykepleier om dere tror at pasienten er terminal.
- Fyll ut avdelingsspesifikke spørsmål og bruk skjemaene "Ernæringscreening" som ligger i konvolutten til å screene pasienter som ønsker å være med i studien.
- Når dere er ferdige med screeningen, legg utfylte skjemaer og målebånd tilbake i konvolutten. Konvolutten legger dere i ekspedisjonen i avdelingen. Her hentes de av Helene i løpet av dagen. Dere kan også levere konvolutten til Helene som sitter i kantina.

Dette finner dere oppi konvolutten:

- Screeningsskjemaet, som skal fylles ut for pasienter som ønsker å være med i studien
- "Veiledning for utfylling av skjemaet ernæringscreening", **les denne før dere begynner med screeningen**
- Informasjonsskriv til pasienter (gis til pasienter som ønsker å være med i studien)
- Individrettede tiltak ved tilstedeværelse av ernæringsmessig risiko, gi denne til avdelingen, slik at de kan iverksette tiltak på pasienter som er i ernæringsmessig risiko.

Kontaktinformasjon ved spørsmål:

Stipendiat: Helene Dahl Eide, email: [redacted] tlf: [redacted]
Førstelektor: [redacted], email: [redacted], tlf: [redacted]

Helene går rundt til hver avdeling i løpet av dagen, og er til stede på [redacted] frem til klokken 16.00.
Det er bare å ringe ved spørsmål eller om dere trenger flere skjemaer ☺ Lykke til!

Appendix 3

Ernæringscreening

Individspesifikke data:

Avdeling (kode):

1. Dato for denne innleggelsen: 2. Evt. operasjonsdato:
3. Alder (år): 4. Kjønn: ☐ Kvinne ☐ Mann 5. Normalvekt (kg):
(Hva pasienten har veid de siste månedene)
6. Bakgrunn/opprinnelsesland:
☐ Født og oppvokst i Norge
☐ Innvandrer med bakgrunn(eget fødeland) fra Europa
☐ Innvandrer med bakgrunn(eget fødeland) fra Nord-/Mellom-Amerika/Australia/Oceania
☐ Innvandrer med bakgrunn(eget fødeland) fra Asia
☐ Innvandrer med bakgrunn(eget fødeland) fra Sør-Amerika
☐ Innvandrer med bakgrunn(eget fødeland) fra Afrika
7. Innleggesdiagnose(r):
(Se siste daterte innkomstjournal)
8. Kryss av for andre diagnoser: (Se siste daterte innkomstjournal og epikriser)
☐ Diabetes M. type 1 (E10) ☐ Underernæring (E43, E44, E46) ☐ Kreft (C00-C97): Type:
☐ Diabetes M. type 2 (E11) ☐ Fedme/sykkelig overvekt (E66) ☐ Hjerneslag (I61, I63, I64)
☐ Ødem (R60) ☐ KOLS (J44) ☐ Hjertesvikt (I50)
☐ Andre diagnoser: ☐ Brudd i lårhals (S72)
.....
.....
9. Vekt (kg): 10. Type vekt brukt: ☐ Ståvekt ☐ Stolvekt ☐ Sengevekt
(Se veiledningen til screeningsskjemaet for hvordan vekten skal måles)
11. Høyde (m): 12. Høyden ble målt: ☐ Stående ☐ Halvt armspan, cm:
(Se veiledningen til screeningsskjemaet for hvordan høyden skal måles)
13. Kroppsmasseindeks (BMI): (Se formel neste side)
14. Er pasienten i ernæringsmessig risiko (score ≥ 3)? ☐ Ja ☐ Nei ☐ Vet ikke
(Bruk screeningsskjemaet NRS 2002 på neste side)

Ernæringsbehandlingen ved institusjonen: (alle spørsmål gjelder nåværende innleggelse)

15. Vekt (kg) dokumentert ved innleggelse ☐ Ikke dokumentert vekt
(Se siste daterte innkomstjournal, normalstatus, veiledende behandlingsplan, kurven)
16. For pasienter som har ligget inne 7 dager eller mer; siste dokumenterte vekt(kg): 17. Dato:.....
(Se normalstatus, veiledende behandlingsplan, kurven)
18. Er det blitt brukt et screeningsverktøy for å vurdere om pasienten er i ernæringsmessig risiko?
☐ Ja ☐ Nei ☐ Vet ikke
19. Kryss av for alle eventuelle dokumenterte individrettede ernæringstiltak hos pasienten:
(Se veiledende behandlingsplan, rapporter, kurven)
☐ Ingen tiltak
☐ Tilrettelegging av spisesituasjonen (*sittestilling, spisemiljø, mating, hjelpemidler, skjerming etc.*)
☐ Tilrettelegging av måltider (*porjonsstørrelse, utseende, ferdig påsmurt mat etc.*)
☐ Tilpasset kost (*spesialkost, konsistens, f.eks: fettfattig, flytende, glutenfri, laktoseredusert, natriumfattig etc.*)
☐ Energi og næringsberiket kost (*f.eks tilsatt fløte, olje, egg, næringspulver, mye pålegg etc.*)
☐ Mellommåltider (*ekstra mat mellom hovedmåltidene, f.eks: snacks, frukt, yoghurt etc.*)
☐ Næringsdrikker
☐ Sondeernæring (*enteral ernæring*)
☐ Intravenøs ernæring (*parenteral ernæring*)
☐ Total intravenøs ernæring (*TPN = total parenteral ernæring*)
☐ Henvist klinisk ernæringsfysiolog
☐ Annet:

Screening av ernæringsmessig risiko(NRS 2002)

Innledende screening

		JA	NEI
1	Er BMI < 20,5?		
2	Har pasienten tapt vekt i løpet av de siste ukene?		
3	Har pasienten hatt redusert næringsinntak de siste ukene?		
4	Er pasienten alvorlig syk?		
Ja	Dersom svaret er JA på noen av disse spørsmålene, gjennomføres hovedscreeningen under.		
Nei	Dersom svaret er NEI på alle svarene, gjennomføres innledende screening ukentlig. Dersom pasienten skal gjennomgå planlagt større kirurgi, skal en forebyggende ernæringsplan vurderes for å unngå assosiert ernæringsrisiko.		

Hovedscreening - vurdering av risikograd

Score	Ernæringsstilstand	Score	Sykdommens alvorlighetsgrad
0	Normal ernæringsstilstand	0	Ikke syk
1	Vekttap 5-10% siste 3 mnd. og/eller Matinntak 50-75% av behov i mer enn en uke	1	En pasient med kronisk sykdom eller en pasient som har gjennomgått et mindre kirurgisk inngrep. Studier er gjort på pasienter med leverchirose, nyresvikt, kronisk lungesykdom, kreftpasienter, pasienter med collum femoris fraktur, etter cholecystectomi og laparoskopiske operasjoner.
2	Vekttap 10-15% siste 3 mnd. og/eller BMI 18.5-20.5 og/eller Matinntak 25-50% av behov i mer enn en uke.	2	En pasient med tydelig redusert allmenntilstand pga sin sykdom. Studier er gjort på pasienter med alvorlig pneumoni, inflammatorisk tarmsykdom med feber, akutt nyresvikt, større kirurgiske inngrep som kolektomi og gastrektomi, ileus, anastomoselekkasje og gjentatte operasjoner.
3	Vekttap > 15% siste 3 mnd. og/eller BMI < 18.5 og/eller Matinntak 0-25% av behov i mer enn en uke.	3	En pasient som er alvorlig syk. Studier er gjort på pasienter med store apopleksier, alvorlig sepsis, intensivpasienter (APACHE>10), benmargstransplantasjoner, store hodeskader, brannskader>40% og alvorlig akutt pancreatitt.

Kommentarer:

.....

Forklaring til hovedscreening

Ernæringsmessig risiko vurderes på bakgrunn av ernæringsstilstand og sykdommens alvorlighetsgrad ved hjelp av tabellen til venstre på følgende måte:
<ul style="list-style-type: none">Pasienten scores fra 0-3 for ernæringsstilstand.
<ul style="list-style-type: none">Pasienten scores fra 0-3 for sykdommens alvorlighetsgrad.
<ul style="list-style-type: none">For pasienter eldre enn 70 år legges det til 1 score.
<ul style="list-style-type: none">Dersom summen av scorene blir ≥ 3, er pasienten i ernæringsmessig risiko og målrettet ernæringsbehandling må iverksettes.
<ul style="list-style-type: none">Dersom summen av scorene blir < 3, er pasienten ikke i ernæringsmessig risiko. Screening gjentas etter en uke.

Formler med eksempler til hjelp:

1. Kroppsmasseindeks (BMI)= vekt/(høyde x høyde)

Eksempel: Turid veier 56kg, og er 1.60m høy. Hva er hennes BMI?

Utrekning: 56/(1.60 x 1.60) → 56/2.56 = 21.9

Svar: Turids BMI er 21.9 kg/m²

2. % Vekttap= $\frac{\text{vekt nå} - \text{vekt før}}{\text{vekt før}} \times 100\%$

Eksempel: Turid veier 56 kg. For 3 måneder siden veide hun 60 kg. Hvor mange prosent har hun tapt i vekt?

Utrekning: $\frac{(56-60) \times 100}{60} \rightarrow -400/60 = -6,7\%$

Svar: Turid har tapt 6,7 % i vekt i løpet av de siste 3 månedene

Appendix 4

Initial screening:		Yes	No
1. Is BMI <20.5 kg/m ² ?			
2. Has the patient lost weight within the last few weeks?			
3. Has the patient had a reduced dietary intake in the last weeks?			
4. Is the patient severely ill?			
<p>Yes: If the answer is 'Yes' to any question, the final screening is performed.</p> <p>No: If the answer is 'No' to all questions, the patient is re-screened at weekly intervals. If the patient is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.</p>			
Final screening:			
Score	Nutritional status	Score	Severity of disease
0	Normal nutritional status	0	Not ill
1	Weight loss 5-10% in the last 3 months and/or dietary intake of 50-75% of requirement for a week or more	1	A patient with a chronic disease or a patient who has undergone minor surgery. Studies have been conducted on patients with liver cirrhosis, kidney failure, chronic lung disease and cancer, and on patients with collum femoris fracture, after cholecystectomy, and laparoscopic surgery.
2	BMI 18.5-20.5 kg/m ² and/or recent weight loss 10-15% in the last 3 months and/or dietary intake of 25-50% of requirement for a week or more	2	A patient with significantly reduced general condition due to illness. Studies have been conducted on patients with severe pneumonia, inflammatory bowel disease with fever, acute renal failure, major surgery such as colectomy and gastrectomy, ileus, anastomosis leakage and repetitive operations.
3	BMI ≤18.5 kg/m ² and/or recent weight loss >15% in the last 3 months and/or dietary intake of 0-25% of requirement for a week or more	3	A patient is seriously ill. Studies have been conducted on patients with large apoplexy, severe sepsis, ICU patients (APACHE >10), bone marrow transplants, major head injuries, burns >40% and severe acute pancreatitis.
Explanation of the final screening:			
The patient scores from 0-3 for nutritional status.			
The patient scores from 0-3 for disease severity.			
A score of 1 is added for patients older than 70 years.			
If total score is ≥3, the patient is nutritionally at risk, and nutritional treatment must be initiated.			
If total score is <3, the patient is not nutritionally at risk. Screening must be repeated after one week.			

Veiledning for utfylling av skjemaet "Ernæringscreening"

Individspesifikke data

Spørsmål 5) Normalvekt er det pasienten selv sier hun/han normalt pleier å veie. Altså hva de normalt har pleid å veie de siste månedene.

Spørsmål 7) Innleggelsesdiagnoser finner man i [REDACTED], først og fremst i siste daterte inntakstjournal. For noen pasienter vil det være aktuelt å gå inn i senere legenotat ettersom man ikke alltid vet hvilken diagnose pasienten har ved innleggelse. Skriv inn ICD-10 koder også (om tilgjengelig). ICD-10 koder er et diagnosekodeverk som brukes som redskap for systemisk klassifisering og registrering av sykdommer og beslektede helseproblemer i spesialisthelsetjenesten. For eksempel har Diabetes Mellitus type 1 kode: E10. ICD-10 boken kan lastes ned på www.helsedirektoratet.no.

Spørsmål 8) Andre diagnoser finner man i [REDACTED], først og fremst i siste daterte inntakstjournal, og i tidligere epikriser. Ta med alle diagnoser. Skriv inn ICD-10 koder også (om tilgjengelig). Husk å skrive inn om pasienten har amputert f.eks en fot. Skriv da også inn hvilken kroppsdel som er amputert.

Spørsmål 9) Måling av vekt gjøres stående om pasienten kan stå oppreist. Stolvekt eller sengevekt kan brukes om pasienten ikke kan stå oppreist. For å få mest mulig nøyaktig vekt skal sko og yttertøy tas av. Pasienten veies til nærmeste 0,1 kg.

Spørsmål 10) Måling av høyde gjøres stående med målebånd inntil vegg. For mest mulig nøyaktig høyde skal sko tas av, og hælene skal plasseres inntil veggen. Be pasienten gjøre seg så høye som de klarer. Høyden måles til nærmeste hele cm. Om ikke høyden kan måles stående skal det alternative målet halvt armspan brukes (se neste side for hvordan man måler dette). Skriv inn omregnet høyde i spørreskjemaet i feltet *høyde* og lengden på halvt armspan i feltet for *halvt armspan*.

Spørsmål 13) Kroppsmasseindeks (BMI) beregnes ved hjelp av høyde og vekt som du har målt. Om du ikke fikk målt vekten, kan du bruke en vekt som sykehuset har registrert på pasienten, for eksempel inntakstvekt. Denne skal da maksimalt være en uke gammel.

Spørsmål 14) Er pasienten i ernæringsmessig risiko? Dette skal vurderes ved hjelp NRS 2002, som er på

baksiden av screeningsskjemaet. På baksiden av dette arket finner du en beskrivelse av hvordan NRS 2002 skal fylles ut.

Ernæringsbehandlingen ved institusjonen

Spørsmål 15) Vekt dokumentert ved nåværende innleggelse er den vekten som sykehuset dokumenterte på pasienten ved inntakst. Som regel står denne vekten i [REDACTED] i inntakstjournal, normalstatus, veiledende behandlingsplan eller i kurven (enten i papirkurven eller i den elektroniske versjonen [REDACTED]). Om vekten står flere steder og den er forskjellig, skal den senest registrerte vekten benyttes.

Spørsmål 16) Siste dokumenterte vekt for pasienter som har ligget inne i 7 dager eller mer er den vekten som sist ble registrert på pasienten ved nåværende innleggelse. Dette spørsmålet skal ikke fylles ut for pasienter som har ligget inne i færre enn 7 dager. Husk å notere ned hvilken dato denne vekten ble målt. Vekt registreres som oftest i [REDACTED] i inntakstjournal, normalstatus, veiledende behandlingsplan eller i kurven (enten i papirkurven eller i den elektroniske versjonen [REDACTED]). Man kan også søke i søkefeltet etter vekt (da søker man gjennom alle registrerte dokumenter).

Spørsmål 18) Er det blitt brukt screeningsverktøy for å vurdere om pasienten er i ernæringsmessig risiko? Her blir det spurt om det i løpet av denne innleggelsen er blitt brukt screeningsverktøy for å vurdere pasientens ernæringsstatus/ernæringsmessige risiko. Eks på slike screeningsverktøy; NRS 2002, MNA, MUST, SGA. For å finne ut av dette kan man f.eks søke i søkefeltet med søkeordene *ernæringscreening*, *underernæring*, *ernæringsmessig risiko* osv. Man kan også høre med kontaktsykepleier eller avdelingssykepleier om det benyttes slike screeningsverktøy på avdelingen.

Spørsmål 19) Kryss av for alle eventuelle dokumenterte individrettede ernærings tiltak hos pasienten. Slike tiltak vil man finne i veiledende behandlingsplanen i [REDACTED] (skrevet av sykepleierne), i rapporter eller i kurven (enten i papirkurven eller i den elektroniske versjonen [REDACTED]). For å krysse av i skjemaet må dette være **dokumenterte** tiltak. Om disse tiltakene allikevel gjøres uten at de dokumenteres, skal man altså **ikke** sette noe kryss.

Veiledning til screeningsskjemaet NRS 2002

1) Først gjøres en innledende screening. Denne skal alle pasienter som takker ja til å delta gjennomføre. Den innledende screeningen gjøres ved å besvare spørsmålene 1,2,3 og 4. Man **KRYSSER AV** i rutene JA eller NEI avhengig av svarene på spørsmålene. Dersom svaret er JA på noen av spørsmålene gjennomføres hovedscreeningen. Dersom svaret er NEI på alle spørsmålene krysser dere av for NEI i spørsmål 14 under individspesifikke data. Om pasienten ikke har veid seg i det siste og derfor ikke vet selv om hun/han har gått ned i vekt, kan man for eksempel spørre om klær, klokke, belte etc sitter løsere enn normalt. Med alvorlig syk menes kritisk syk, eks alvorlig sepsis, store hodeskader, intensivpasienter.

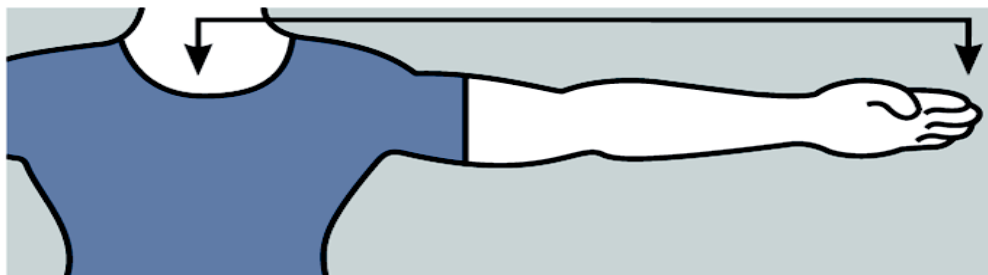
2) Hovedscreeningen går ut på å gi pasienten en score basert på personens ernæringsstilstand og sykdommens alvorlighetsgrad. **RING RUNDT** hvilken score pasienten har innenfor de to kategoriene. **Husk å lese forklaringen til hovedscreeningen!** Vekttap beregnes ved hjelp av formelen i boksen til høyre i spørreskjemaet. Bruk

pasientens rapporterte normalvekt (spørsmål 4) som *vekt før* og den vekten du målte i dag som *vekt nå*. For å spørre om matinntaket har gått ned kan det være lurt å spørre om de for eksempel ikke spiser opp maten lengre eller om de spiser sjeldnere enn før. Sykdommens alvorlighetsgrad scores følgende; **Score 0** om pasienten ikke er syk; **Score 1** om pasienten er kronisk syk eller har gjennomgått mindre kirurgi, det vil si at pasienten er svak men kan gå ut av senga; **Score 2** om pasienten er bundet til senga pga sykdom, for eksempel etterfulgt av stor kirurgi eller alvorlig infeksjon (pasienten har tydelig redusert allmenntilstand pga sin sykdom); **Score 3** om pasienten er alvorlig sykdom, eks alvorlig sepsis, store hodeskader, intensivpasienter. **Husk at det skal legges til en score på 1 for pasienter som er over 70 år.**

Dersom summen av scorene blir 3 eller mer er pasienten i ernæringsmessig risiko, og man skal krysse av for **JA i spørsmål 14**. Dersom summen av scorene blir mindre enn 3 er ikke pasienten i ernæringsmessig risiko, og man krysser av for **NEI i spørsmål 14**.

Måling av halvt armspan:

1. Finn og marker kanten av høyre krageben (ved halsgropen) med en penn.
2. Be pasienten om å holde ut armen horisontalt (bruk venstre arm om mulig).
3. Kontroller at pasientens arm er horisontal og på lik linje med skuldrene.
4. Bruk målebåndet og mål avstanden fra merket på midtpunktet ved halsgropen til tuppen av langfingeren.
5. Kontroller at armen er flatt utstrakt og at håndleddet er strakt.
6. Les av målingen i cm.
7. Beregn høyden i cm ved å gange lengden på halvt armspan med 2.



Referanse: Veiledning for utfylling av skjema for ernæringsvurdering: Mini Nutritional Assessment MNA. Nestle Nutrition Institute.

Ved spørsmål kontakt: Stipendiat Helene Dahl Eide:

Førstelektor

Individrettede tiltak ved tilstedeværelse av ernæringsmessig risiko

Hentet fra retningslinjene "Nasjonale faglige retningslinjer for forebygging og behandling av underernæring". Retningslinjene kan dere finne i fulltekst tilgjengelig på internett:

http://www.helsedirektoratet.no/publikasjoner/nasjonale_faglige_retningslinjer/nasjonale_faglige_retningslinjer_for_forebygging_og_behandling_av_underern_ring_443404

Vurdering av ernæringsmessig risiko alene er ikke tilstrekkelig for å forebygge og behandle underernæring. Dersom pasienten er i risiko vil det være behov for utredning som kobles til en ernæringsplan med tiltak og oppfølging. En ernæringsplan skal inneholde pasientens energi- og væskebehov, energi- og væskeinntak, samt tiltak.

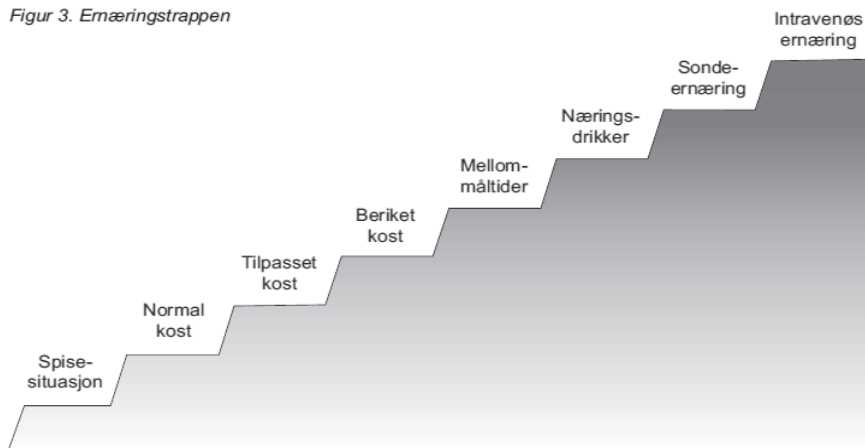
Energi og væskebehov

Det finnes flere metoder og formler for å regne ut pasienters energi- og væskebehov. Statens ernæringsråd har gitt retningslinjer for beregning av energibehov hos ulike grupper pasienter. Som tommelfingerregel kan en bruke 30 kcal/kg kroppsvekt/dag for energibehov og 30 ml/kg kroppsvekt/dag for væskebehov. Det må imidlertid gjøres korrigeringer for ulike aktivitetsnivå og sykdomstilstand. En enkel kartlegging av mat- og drikkeinntak brukes for å kartlegge i hvilken grad pasienten spiser og drikker i forhold til beregnet behov.

Individrettede tiltak

På bakgrunn av opplysninger om pasientens ernæringsstatus, -behov og -inntak settes et mål med behandlingen. Det bør settes opp en plan for tiltak som angir oppstart, opptrapping, oppfølging og avslutning av ernæringsbehandlingen. Ernæringstiltak som skal inngangsettes bør vurderes i prioritert rekkefølge, se ernæringstrappen under. Det kan i noen tilfeller være riktig å begynne på et høyere trinn eller å hoppe over noen trinn i trappen. Poenget er at man kan oppnå mye ved fokus på tiltak som ligger på et lavere kostnadsnivå. Tidlig og ekle tiltak som for eksempel energiberiket kost kan forhindre eller forsinke bruk av fordyrende behandling som for eksempel sondeernæring og intravenøs ernæring.

Figur 3. Ernæringstrappen



Referanse: Helsedirektoratet. Nasjonale faglige retningslinjer for forebygging og behandling av underernæring. 2009.

Spisesituasjon og normalkost

Delikat mat i et hyggelig måltidsmiljø er grunnleggende faktorer for trivsel og god matlyst. Noen ganger er det enkle tiltak som skal til for at pasienten spiser mer. Eksempler på slike tiltak kan være hygiene, spisehjelp, redskaper, trivsel og ro, lukt, smak, konsistens etc. Se flere eksempler i handlingsplanen.

Tilpasset kost og berikning

Pasienter i ernæringsmessig risiko bør få energiberiket kost. En del pasienter har i tillegg behov for en endret sammensetning av kostholdet. Det kan være hensyn av mage/tarmfunksjon, matvareallergi/-intoleranse, nyrefunksjon etc. Ideologiske, religiøse og kulturelle hensyn kan også føre til behov for endret kosthold. En nærmere beskrivelse av spesialkost og indikasjoner for disse finnes i "Retningslinjer for kostholdet i helseinstitusjoner".

Mellommåltider og næringsdrikker

Mellommåltider og næringsdrikker tilbys pasienter som spiser lite til hvert måltid. For noen kan det være enklere å drikke enn å spise. Næringsdrikker som mellommåltider kan øke totalinntaket av energi og næringsstoffer.

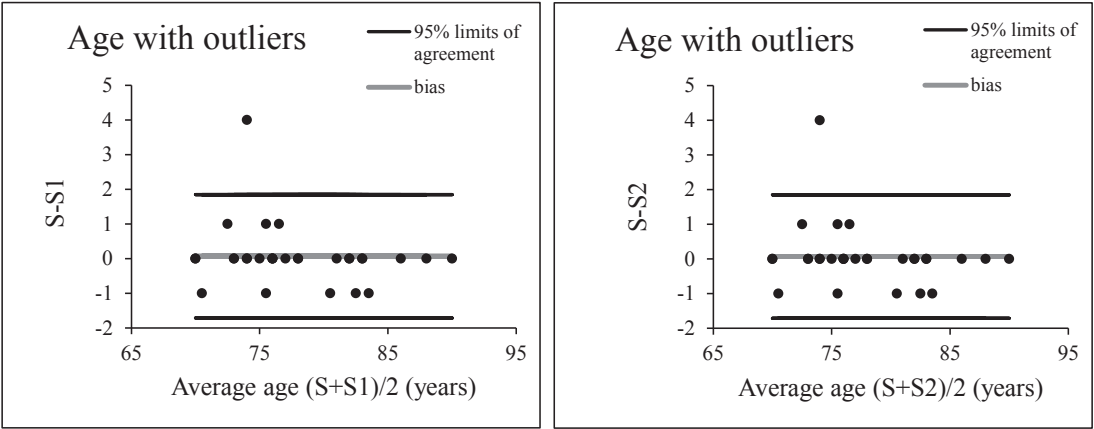
Sonde og/eller intravenøs ernæring

Å gi adekvat ernæringsbehandling er en del av å dekke grunnleggende behov, på lik linje med behov for væske og søvn. Sondeernæring vurderes til pasienter som av en eller annen grunn ikke kan ta til seg mat gjennom munnen eller der dette er utilstrekkelig. Sondeernæring er førstevalget framfor intravenøs ernæring dersom pasienten har en fungerende, tilgjengelig mage- og tarmkanal. Ernæringssonden kan plasseres på flere steder i mage eller i tarmkanalen. I dag brukes ferdig fremstilte sondeernæringsløsninger. Enkelte løsninger er beregnet for spesielle sykdomssituasjoner og har derfor en annen sammensetning. Dersom det ikke er mulig å ernære en pasient gjennom munnen eller sonde, skal man vurdere intravenøs ernæring. Generelt er ferdige løsninger for intravenøs ernæring ikke tilsatt vitaminer og mineraler, dette må derfor tilsettes. Det er svært viktig at indikasjon er til stede og at energibehovet beregnes før man setter i gang aktiv ernæringsbehandling.

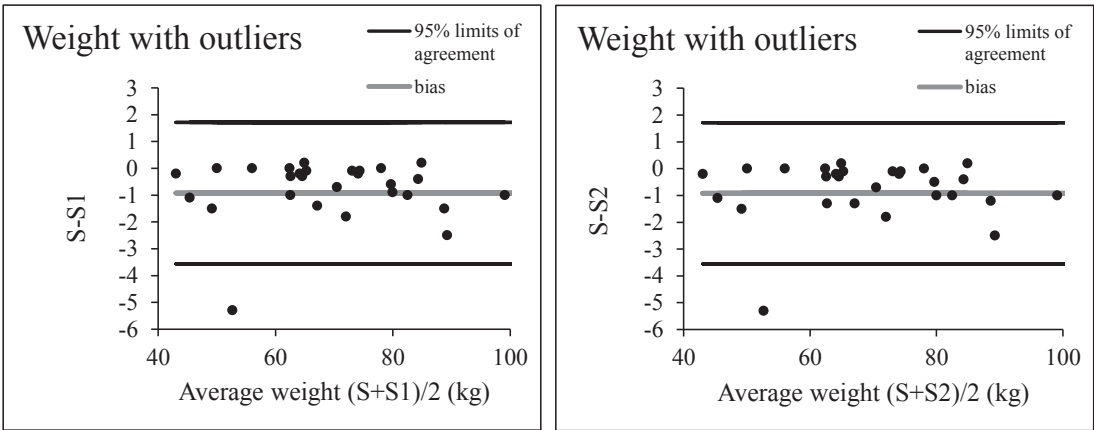
Klinisk ernæringsfysiolog

Om en har forsøkt å igangsette tiltak for å bedre pasientens ernæringsstatus, og tiltakene ser ut til å ha liten effekt bør klinisk ernæringsfysiolog kontaktes. Ta også kontakt med klinisk ernæringsfysiolog dersom en pasient er i ernæringsmessig risiko og du er usikker på hva du bør gjøre.

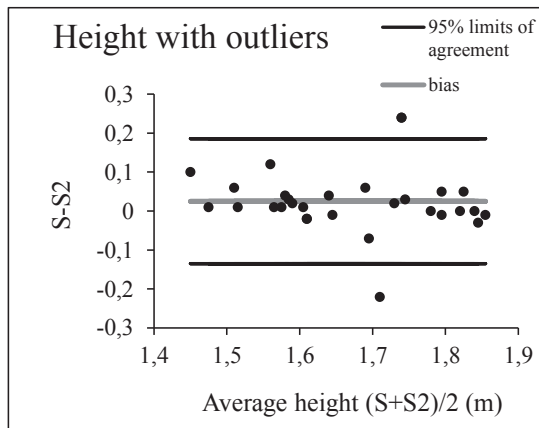
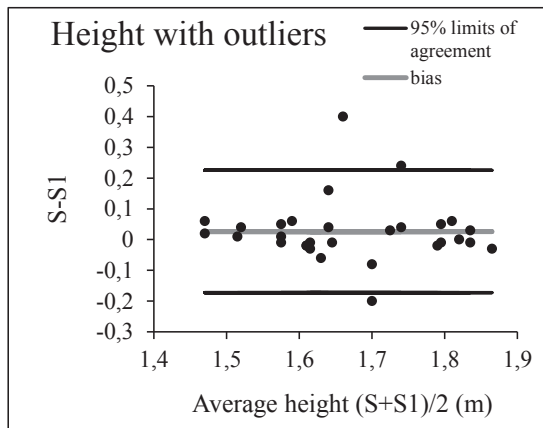
Bland-Altman plots (with outliers) of agreement in age (years) between students performing ordinary screening (S) and S1 and S2. The y-axis shows differences between the two age measurements, while the x-axis shows paired measurements.



Bland-Altman plots (with outliers) of agreement in weight (kg) between students performing ordinary screening (S) and S1 and S2. The y-axis shows differences between the two weight measurements, while the x-axis shows paired measurements.



Bland-Altman plots (with outliers) of agreement in height (m) between students performing ordinary screening (S) and S1 and S2. The y-axis shows differences between the two height measurements, while the x-axis shows paired measurements.





Informasjon om doktorgradsprosjektet:

”Nutritional status and care for elderly patients”

Bakgrunn og hensikt


Dette doktorgradsprosjektet har i hensikt å få økt kunnskap om den ernæringsomsorgen som gis til eldre pasienter i dag for å kunne forebygge og behandle underernæring bedre. Underernæring er et kjent problem blant eldre, og spesielt gjelder dette syke eldre. Fordi underernæring medfører en rekke uheldige konsekvenser som økt sykkelighet, økt dødelighet, økt hjelpebehov og redusert livskvalitet er det ønskelig å forebygge og behandle underernæring i størst mulig grad. I 2010 og 2011 gjennomførte Statens helsetilsyn landsomfattende tilsyn med både kommunale sosial- og helsetjenester og spesialisthelsetjenester til eldre. I begge disse tilsynene fant man store mangler i det daglige arbeidet for å forebygge og behandle underernæring. I denne delen av doktorgradsprosjektet skal vi gjennomføre fokusgruppeintervjuer med helsepersonell for å undersøke hva dere opplever og erfarer som barrierer for å kunne forebygge og behandle underernæring hos eldre i praksis. I tillegg ønsker vi å undersøke hvordan informasjon om ernæring dokumenteres og videreformidles når en eldre pasient overføres mellom sykehus og sykehjem.

Hva innebærer deltakelse i forskningsprosjektet?

Fokusgruppediskusjonen vil bli tatt opp med digital diktafon, og vil bli transkribert om til tekst og analysert i etterkant av intervjuet. Datamaterialet fra fokusgruppeintervjuene vil publiseres som forskning i form av vitenskapelige artikler, og de vil inngå i en doktorgradsavhandling. Din anonymitet og konfidensialitet vil være ivaretatt, og alt datamaterialet vil være avidentifisert. Det vil ikke være mulig å identifisere deg, avdelingen eller institusjonen du jobber ved i resultatene av studien når disse publiseres. Kun stipendiaten og veiledere i doktorgradsprosjektet har adgang til dataene som innhentes. Dataene som innhentes vil slettes og makuleres når resultatene fra studien er publisert.

For å delta i studien må det undertegnes et *skriftlig informert samtykke*. Deltakelse i studien er frivillig, og du kan når som helst trekke deg uten å oppgi noen grunn. Å trekke seg fra studien vil ikke medføre noen uheldige konsekvenser for deg.

Som deltaker i studien har du rett til å få innsyn i hvilke opplysninger som er registrert om deg, og du har videre rett til å få korrigert eventuelle feil i de opplysningene vi har registrert. Du har også rett til å få informasjon om utfallet eller resultatet av studien. Du kan når som helst ta kontakt om du har spørsmål om forskningsstudien. Dersom du trekker deg fra studien, kan du kreve å få slettet innsamlede data og opplysninger, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner.



Om du ønsker å være fokusgruppedeltaker, men må reise for å kunne være deltaker vil vi dekke dine reiseutgifter i forbindelse med dette. Det vil bli servert lett mat og drikke under fokusgruppeintervjuene. Fokusgruppeintervjuene vil foregå på arbeidsstedet ditt, enten før kveldsvakt eller etter dagvakt. Som deltaker skal du delta i ett fokusgruppeintervju, og dette intervjuet vil vare i maksimalt to timer.

Doktorgradsprosjektet finansieres av [REDACTED] gjennom forskningsmidler fra Helse Sør-Øst. Prosjektansvarlig eller andre som arbeider med prosjektet har ingen form for økonomisk vinning til prosjektet. Prosjektleder og hovedveileder i doktorgradsprosjektet er Professor Kari Almendingen. Medveiledere er førsteamanuensis og intensivsykepleier Kristin Halvorsen og forsker og statistiker PhD Jūratė Šaltytė Benth.

Har du spørsmål om deltakelse i fokusgruppeintervjuene eller om doktorgradsprosjektet, ta kontakt med stipendiat Helene Dahl Eide: [REDACTED]

Vi ser frem til å møte deg!

Med vennlig hilsen

Helene Dahl Eide
stipendiat



SKRIFTLIG INFORMERT SAMTYKKE

Til sykepleiere og helsefagsarbeidere/hjelpepleiere/omsorgsarbeidere/vernepleiere som har takket ja til å være deltakere i fokusgruppeintervjuer i doktorgradsprosjektet «Nutritional status and care for elderly patients».

Hensikten med dette doktorgradsprosjektet er å få økt kunnskap om den ernæringsomsorgen som gis til eldre pasienter i dag for å kunne forebygge og behandle underernæring bedre. I denne delstudien skal det gjennomføres fokusgruppeintervjuer av helsepersonell ansatt i sykehus og sykehjem, for å undersøke hva dere opplever som barrierer for å kunne forebygge og behandle underernæring blant eldre i praksis. I tillegg ønsker vi å undersøke hvordan informasjon om ernæring dokumenteres og videreformidles når en eldre pasient overføres mellom sykehus og sykehjem.

Når du sier deg villig til å være deltaker må du undertegne dette *skriftlig informert samtykke*. Din signatur av samtykkeerklæringen betraktes som ditt samtykke.

Gjennom innlevering av samtykkeerklæringen bekrefter du:

- Jeg har mottatt og lest informasjon om delstudien i dette doktorgradsprosjektet, og er kjent med forskningens hensikt.
- Jeg er informert om at det å være deltaker er frivillig, og at jeg kan trekke meg når som helst om jeg måtte ønske det, uten at dette vil medføre noen uheldige konsekvenser for meg. Jeg vet at hvis jeg trekker meg, så vil alt datamaterialet jeg har gitt fra meg umiddelbart bli makulert, og ikke benyttet i forskningen.
- Jeg er innforstått med at min anonymitet og konfidensialitet er sikret i behandlingen av datamaterialet som samles inn under fokusgruppeintervjuene.

På bakgrunn av den informasjonen jeg har fått om studien sier jeg meg villig til å delta.

Yrkestittel:

Navn (blokkbokstaver):

Dato/ sted:..... Signatur:



WRITTEN INFORMED CONSENT

Dear nurses, nurse-students, auxiliary nurses, who have agreed to participate in the PhD project «Nutritional status and care for elderly patients».

The purpose of this PhD project is to gain increased knowledge about the nutritional care that elderly patients receive today, to prevent and treat malnutrition better. In this part-study focus-groups with health care workers (nurses and auxiliary nurses) in hospitals and nursing homes will be conducted, to examine how health care workers experiences that nutritional care for elderly patients is maintained to prevent and treat malnutrition today. Nurse students that have been in practice at the relevant departments will also participate.

As you are willing to participate, you must sign this *written informed* consent. Your signature is considered as your consent.

By returning this written informed consent, you confirm that:

- I have received and read information about this part-study, and are familiar with the objective of the research.
- I am informed that participating is voluntary, and that I have the opportunity to withdraw from the project whenever I want, without any unfortunate consequences for me. I know that all data material from me will be maculated and not used in the research if I withdraw from participating.
- I understand that my anonymity and confidentiality is secured when dealing with the data material.

I am willing to participate in this study on behalf of the information I have received.

Profession/student:

Name (block letters):

Date/ place: Signature:



Intervjuguide sykehus-settingen, sub-studie I, på norsk

1. Tenk på det arbeidet som gjøres ved deres avdeling, og diskuter følgende utsagn: «Alle eldre pasienter skal vurderes for underernæring/ernæringsmessig risiko ved innleggelse og deretter ukentlig».
 - Skjer dette rutinemessig? Systematisk?
 - Erfarer dere at alle eldre pasienter som er underernært eller i risiko for underernæring blir fanget opp ved deres avdeling?
 - Kartlegges dette for alle eller bare for noen eldre pasienter? (normalvektige, overvektige etc.)
 - Hva kartlegger dere? (BMI, vekttap, vekt, høyde, matlyst, matinntak)
 - Nok utstyr til å kunne kartlegge?
 - Retningslinjer og rutiner for hva som skal kartlegges og når?
 - Erfaringer fra å kartlegge og vurdere underernæring hos eldre i praksis? (pasienteksempel, hvilke problemer/utfordringer møter dere på?)
 - Ressurser og tid, prioritering
 - Kunnskap; seg selv og andre nok kunnskap til å gjøre dette? Noen å spørre?
 - Ansvarsfølelse og ansvarsfordeling; hvem har ansvar?
 - Mange eldre taper vekt i forbindelse med et sykehusopphold. Opplever dere at dette blir fanget opp ved deres avdeling?
2. Diskuter hva dere tror er viktig for at flere eldre som er underernært eller i risiko for underernæring skal bli fanget opp ved innleggelse ved deres avdeling? (noe som bør være annerledes? Hva virker fremmende/hemmende på dette arbeidet, at det gjøres systematisk?)
3. Tenk på det arbeidet som gjøres ved deres avdeling, og diskuter følgende utsagn: «Alle eldre pasienter skal vurderes for underernæring/ernæringsmessig risiko ved innleggelse og deretter ukentlig».
 - Skjer dette rutinemessig? Systematisk?
 - Erfarer dere at alle eldre pasienter som er underernært eller i risiko for underernæring blir fanget opp ved deres avdeling?
 - Kartlegges dette for alle eller bare for noen eldre pasienter? (normalvektige, overvektige etc.)
 - Hva kartlegger dere? (BMI, vekttap, vekt, høyde, matlyst, matinntak)
 - Nok utstyr til å kunne kartlegge?
 - Retningslinjer og rutiner for hva som skal kartlegges og når?
 - Erfaringer fra å kartlegge og vurdere underernæring hos eldre i praksis? (pasienteksempel, hvilke problemer/utfordringer møter dere på?)
 - Ressurser og tid, prioritering
 - Kunnskap; seg selv og andre nok kunnskap til å gjøre dette? Noen å spørre?
 - Ansvarsfølelse og ansvarsfordeling; hvem har ansvar?
 - Mange eldre taper vekt i forbindelse med et sykehusopphold. Opplever dere at dette blir fanget opp ved deres avdeling?
4. Diskuter hva dere tror er viktig for at flere eldre som er underernært eller i risiko for underernæring skal bli fanget opp ved innleggelse ved deres avdeling? (noe som bør være annerledes? Hva virker fremmende/hemmende på dette arbeidet, at det gjøres systematisk?)
5. Tenk på det arbeidet som gjøres ved den avdelingen som dere jobber ved, og diskuter følgende utsagn: «Det skal bli igangsatt individuelt målrettede ernæringstiltak for eldre pasienter som er underernærte eller i risiko for underernæring».
 - Skjer dette rutinemessig?
 - Erfarer dere at alle eldre pasienter som er underernært eller i risiko for underernæring blir fulgt opp ved deres avdeling?
 - Hvordan igangsettes disse ernæringstiltakene?
 - Er tiltakene individuelt målrettede?
 - Evalueres effekten av tiltakene?
 - Retningslinjer og rutiner for hvordan behandle underernæring for eldre?
 - Ressurser og tid, prioritering
 - Kunnskap; seg selv og andre nok kunnskap til å gjøre dette? Noen å spørre?
 - Ansvarsfølelse og ansvarsfordeling; hvem har ansvar?
 - Erfaringer fra å igangsette slike tiltak i praksis (pasienteksempel)
 - På hvilken måte involveres legen, diskuter hvordan deres synes dette samarbeidet fungerer?
 - Diskuter hvordan dere synes samarbeidet med KEFF fungerer?

- Diskuter hvordan dere synes samarbeidet med kjøkkenet fungerer?
 - Klart skille mellom det som defineres som ernæringsbehandling og matomsorg?
6. Diskuter hva dere tror er viktig for at det skal bli igangsatt individuelt målrettede ernæringstiltak for flere eldre som er underernært eller i risiko for underernæring? (noe som bør være annerledes? Hva virker fremmende/hemmende på dette arbeidet?)
 7. Beskriv hva slags type informasjon som dokumenteres om ernæring i journal for eldre pasienter som er innlagt ved deres avdeling? Hvor dokumenteres det?
 - Normalstatus, behandlingsplan
 - Ernæringsstatus: vekt, høyde, KMI, vekttap, matlyst, underernæring
 - Ernæringstiltak
 - Matinntak, energi- og næringsbehov
 - Diagnosekoden «Underernæring»
 8. Diskuter hvordan dere synes dokumentasjon om ernæring fungerer ved deres avdeling.
 - Hvordan opplever dere det er å finne den informasjonen dere er ute etter i journal når det gjelder ernæringsstatus og ernæringstiltak for eldre pasienter som er innlagt ved deres avdeling?
 - Dokumenteres det tilstrekkelig med informasjon? Riktig type informasjon?
 - Opplever dere at denne dokumentasjonen er systematisk?
 9. Mange syke eldre pasienter med komplekse og multiple sykdomsbilder overføres hyppig mellom sykehus og sykehjem. Beskriv hva slags type informasjon som videreformidles om ernæring for eldre pasienter når de skrives ut til sykehjem fra deres avdeling i sykepleiesammenfatningen?
 - Ernæringsstatus: vekt, høyde, KMI, vekttap, matlyst, underernæring
 - Ernæringstiltak
 - Matinntak, energi- og næringsbehov
 - Nok informasjon? Riktig type informasjon?
 10. Når en eldre pasient blir innlagt ved deres avdeling fra sykehjem. Beskriv hva slags type informasjon om ernæring som videreformidles da?
 - Ernæringsstatus: vekt, høyde, KMI, vekttap, matlyst, underernæring
 - Ernæringstiltak
 - Matinntak, energi- og næringsbehov
 - Nok informasjon? Riktig type informasjon?
 11. Diskuter hvordan dere opplever at kommunikasjonen mellom sykehjem/kommunehelsetjenesten og avdelingen fungerer når det kommer til å videreformidle informasjon om ernæring for eldre pasienter?

Interview guide, the hospital setting, sub-study I, in english

1. Think about the work performed on your wards, and discuss the following statement: ‘All elderly patients must be screened for undernutrition/nutritional risk on hospital admission and then weekly’.
 - Does this happen routinely? Systematically?
 - In your experience are all elderly patients who are undernourished or at risk of becoming so captured on your ward?
 - Is this done for all or just some elderly patients? (normal weight, overweight etc.)
 - What is identified? (BMI, weight loss, weight, height, food intake, appetite)
 - Enough equipment to identify?
 - Guidelines and routines for what to identify and when?
 - Experiences from identifying and evaluating undernutrition in the elderly in practice? (patient-example, what problems/challenges do you meet?)
 - Resources and time, prioritizing
 - Knowledge; do yourself and others have enough knowledge to do this? Somebody to ask?
 - Sense of responsibility and distribution of responsibilities; who is responsible?
 - Many elderly lose weight during hospital stay. In your experience is this captured on your wards?
2. Discuss what you think is important for more elderly who are undernourished or at risk of becoming so to be caught on admission on your wards? (Anything that should be different? What is promoting/inhibiting this work, or that it be done systematically?)

3. Think about the work performed on your wards and discuss the following statement: 'Individually targeted nutritional treatment measures will be developed for elderly patients who are undernourished or at risk of becoming so'.
 - Does this happen routinely?
 - Do you experience that all elderly patients who are undernourished or at risk of becoming so are followed up on your ward?
 - How are these nutritional measures initiated?
 - Are the measures individually targeted?
 - Is the effect of the measures evaluated?
 - Guidelines and routines for how to treat undernutrition in the elderly?
 - Resources and time, prioritizing
 - Knowledge; do yourself and others have enough knowledge to do this? Somebody to ask?
 - Sense of responsibility and distribution of responsibilities; who is responsible?
 - Experiences from initiating measures in practices (patient-example)
 - In what way is the physician involved, discuss how you think this collaboration works.
 - Discuss how you think the collaboration with the clinical dietitians works.
 - Discuss how you think the collaboration with the kitchen works.
 - Clear distinction between what is defined as nutritional treatment and food care?
1. Discuss what you think is important for individually targeted nutritional treatment measures to be initiated for more elderly who are undernourished or at risk of becoming so? (Anything that should be different? What is promoting/inhibiting this work?)
2. Describe what type of information is documented on nutrition in the patients' records for elderly patients on your wards. Where is this documented?
 - Normal status, treatment plan
 - Nutritional status: weight, height, BMI, weight loss, appetite, undernutrition
 - Nutritional measures
 - Food intake, energy and nutrient needs
 - The diagnostic Code 'Undernutrition'
1. Discuss how you think documentation on nutrition works on your wards.
 - What is it like to find the information you are looking for on nutritional status and measures for elderly patients in the records on your wards?
 - Is sufficient information being documented? The right kind of information?
 - In your experience is this documentation systematic?
2. Many elderly patients with complex and multiple disease pictures are frequently transferred between hospitals and nursing homes. Describe the type of information that is communicated about nutrition in the nursing summary for elderly patients when they are discharged from your ward to a nursing home.
 - Nutritional status: weight, height, BMI, weight loss, appetite, undernutrition
 - Nutritional measures
 - Food intake, energy and nutrient needs
 - Enough information? The right kind of information?
3. When an elderly patient is admitted to your ward from a nursing home what type of nutritional information is communicated then?
 - Nutritional status: weight, height, BMI, weight loss, appetite, undernutrition
 - Nutritional measures
 - Food intake, energy and nutrient needs
 - Enough information? The right kind of information?
4. Discuss how you feel that the communication between nursing homes/municipal healthcare services and your wards works when it comes to communicating information about nutrition for elderly patients.

Intervjuguide sykehjem-setting, sub-studie II, på norsk (kun diskusjonsspørsmål 5-9 ble inkludert i denne doktorgradsavhandlingen)

1. Diskuter utsagnet: ”Alle eldre beboere skal vurderes for underernæring og risiko for underernæring ved innleggelse og deretter månedlig”.
 - Erfarer dere at alle eldre beboere som er underernærte eller i risiko for underernæring blir fanget opp ved deres avdeling?
 - Skjer dette rutinemessig? Systematisk?
 - Ansvarsfølelse og ansvarsfordeling; hvem har ansvaret for dette?
 - Vurderes dette for alle? (normalvektige og overvektige etc.)
 - Retningslinjer og rutiner for hva som skal kartlegges og hvordan?
 - Hva kartlegger dere? (BMI, vekttap, vekt, høyde, matlyst, matinntak)
 - Kunnskap; seg selv og andre nok kunnskap til å gjøre dette?
 - Nok utstyr?
 - Ressurser og tid, prioritering
 - Dialogen med legen? (Tilsynslege eller egen sykehjemslege?) (Diagnose: T05 Ernæringsproblem for voksen)
 - Mange eldre taper vekt i forbindelse med et institusjonsopphold. Opplever dere at dette blir fanget opp ved deres avdeling?
2. Diskuter hva dere tror er viktig for at flere eldre som er underernært eller i risiko for underernæring skal bli fanget opp ved deres avdeling? (Noe som bør være annerledes? Hva virker fremmende/hemmende på dette arbeidet?)
3. Diskuter utsagnet: «Det skal bli igangsatt ernæringstiltak for eldre beboere som er underernærte eller i risiko for underernæring».
 - Erfarer dere at det blir igangsatt ernæringstiltak for alle eldre beboere som er underernærte eller i risiko for underernæring?
 - Skjer dette rutinemessig? Systematisk?
 - Ansvarsfølelse og ansvarsfordeling; hvem har ansvaret for dette?
 - Det tverrfaglige samarbeidet; vernepleier, fysio, lege, sykepleier, helsefagarbeider, ufaglærte
 - Retningslinjer og rutiner for igangsetting av ernæringstiltak?
 - Kunnskap; seg selv og andre nok kunnskap til å gjøre dette?
 - Er tiltakene individuelt tilpasset den enkelte beboer?
 - Evalueres effekten av tiltakene?
 - Ressurser og tid, prioritering
 - Samarbeidet med kjøkkenet?
 - Dialogen med legen?
4. Diskuter hva dere tror er viktig for at det skal bli igangsatt ernæringstiltak for flere eldre som er underernært eller i risiko for underernæring? (Noe som bør være annerledes? Hva virker fremmende/hemmende på dette arbeidet?)
5. Beskriv hva slags type informasjon som dokumenteres om ernæring i journal for eldre beboere som er innlagt ved deres avdeling?
 - Sammenfatningen/hovedkort, tiltaksplanen, målinger
 - Vekt, høyde, KMI, vekttap, matlyst, matinntak, underernæring, ernæringstiltak
 - Diagnosekoden underernæring
6. Diskuter hvordan dere synes dokumentasjon om ernæring fungerer ved deres avdeling.
 - Dokumenteres det tilstrekkelig med informasjon? Riktig type informasjon?
 - Opplever dere at denne dokumentasjonen er systematisk?
 - Hvordan opplever dere det er å finne den informasjonen dere er ute etter i journal når det gjelder ernæringsstatus og ernæringstiltak for eldre beboere som er innlagt ved deres avdeling?
7. Mange syke eldre med komplekse og multiple sykdomsbilder overføres hyppig mellom sykehus og sykehjem. Diskuter hvordan dere opplever at kommunikasjonen mellom sykehjem og sykehus fungerer når det kommer til å videreformidle informasjon om ernæring for eldre?
8. Beskriv hva slags type informasjon som videreformidles om ernæring for eldre når de skrives ut fra sykehus til deres sykehjem? Hvor videreformidles det?
 - Sykepleiesammenfatningen, epikriser
 - Vekt, høyde, KMI, vekttap, matlyst, matinntak, underernæring, ernæringstiltak (diagnosen)
 - Diagnosen underernæring
 - Nok informasjon? Riktig type informasjon?

- Pårørende sin rolle?
- 9. Når eldre legges inn på sykehus fra deres sykehjem. Beskriv hva slags type informasjon om ernæring som videreformidles da? Hvor videreformidles det?
 - Sammenfatningen/hovedkort, tiltaksplan
 - Vekt, høyde, KMI, vekttap, matlyst, matinntak, underernæring, ernæringstiltak
 - Nok informasjon? Riktig type informasjon?
 - Pårørende sin rolle i dette?

Interview guide, the nursing home setting, sub-study II, in english (only discussion questions 5–9 were included in this thesis)

1. Discuss the following statement: ‘All elderly residents must be screened for undernutrition/nutritional risk at the outset and then monthly’.
 - Do you experience that all elderly residents who are undernourished or at risk of becoming so are caught in your unit?
 - Does this happen routinely? Systematically?
 - Sense of responsibility and distribution of responsibilities; who is responsible?
 - Is this done for all or just some elderly patients? (normal weight, overweight etc.)
 - Guidelines and routines for what to identify and how?
 - What is identified? (BMI, weight loss, weight, height, food intake, appetite)
 - Knowledge; do yourself and others have enough knowledge to do this?
 - Enough equipment?
 - Resources and time, prioritizing
 - The dialogue with the doctor? (‘Tilsynslege’ or their own nursing home doctor?) (Diagnosis: T05 Nutritional problem for adults)
 - Many elderly lose weight during institutionalization. In your experience is this caught in your unit?
2. Discuss what you think is important for more elderly who are undernourished or at risk of becoming so to be caught on your units? (Anything that should be different? What is promoting/inhibiting this work?)
3. Discuss the following statement: ‘Individually targeted nutritional treatment measures will be developed for elderly residents who are undernourished or at risk of becoming so’.
 - Do you experience that individual action plans are developed for all elderly residents who are undernourished or at risk of becoming so?
 - Does this happen routinely? Systematically?
 - Sense of responsibility and distribution of responsibilities; who is responsible?
 - The interdisciplinary collaboration; social worker, physio, doctor, nurse, care worker, unskilled
 - Guidelines and routines for initiation of nutritional measures?
 - Knowledge; do yourself and others have enough knowledge to do this?
 - Are the measures individually targeted?
 - Is the effect of the measures evaluated?
 - Resources and time, prioritizing
 - Cooperation with the kitchen
 - The dialogue with the doctor
4. Discuss what you think is important for individually targeted nutritional treatment measures to be initiated for more elderly who are undernourished or at risk of becoming so? (Anything that should be different? What is promoting/inhibiting this work?)
5. Describe what type of information is documented on nutrition in the elderly residents’ records on your units.
 - The summary, the action plan, measurements
 - Weight, height, BMI, weight loss, appetite, food intake, undernutrition, nutritional measures
 - The diagnostic Code ‘Undernutriton’
6. Discuss how you think documentation on nutrition works on your units?

- Is sufficient information being documented? The right kind of information?
 - In your experience is this documentation is systematic?
 - What is it like to find the information your are looking for on nutritional status and measures for elderly residents in the records on your units?
7. Many elderly patients with complex and multiple disease pictures are frequently transferred between hospitals and nursing homes. Discuss how you feel the communication between the nursing home and the hospital works when it comes to communicating information about nutrition for the elderly.
 8. Describe the type of information that is communicated about nutrition for elderly when they are discharged from hospital to your nursing home.
 - The nursing summary, discharge summaries
 - Weight, height, BMI, weight loss, appetite, food intake, undernutrition, nutritional measures
 - The diagnostic Code 'Undernutrition'
 - Enough information? The right kind of information?
 - The role of the relatives in this?
 9. When elderly patients are admitted to hospital from your nursing home, what type of nutritional information is communicated then? Where is it communicated?
 - The summary, the action plan
 - Weight, height, BMI, weight loss, appetite, food intake, undernutrition, nutritional measures
 - Enough information? The right kind of information?
 - The role of the relatives in this

